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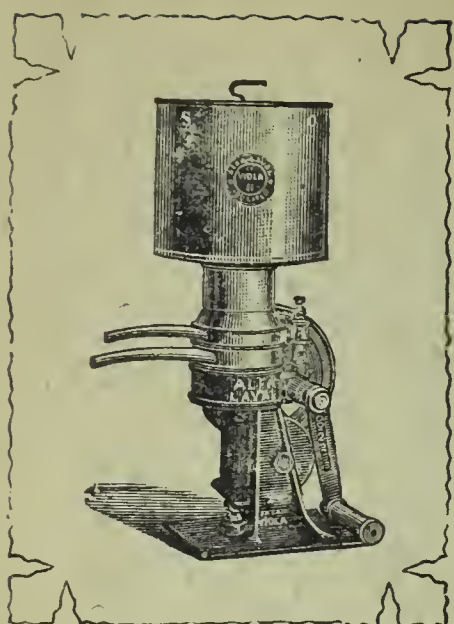
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L. O'LOUGHLIN,

Minister of Agriculture.

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Points for Producers.

Rust in Wheat.

On numerous occasions the contradictory nature of reports published in different countries on the rust-resisting qualities of a particular variety of wheat have been commented on. The Durum or Macaroni wheats have at times been claimed to be almost rust-proof; yet these wheats have in some parts of America been badly attacked. Again, some of our own rust-resisting wheats have failed in America. In an article on "Rust in Wheat," by Professor R. H. Biffen, M.A., of Cambridge University, it is stated that while in Australia and other parts *Puccinia graminis* is the prevalent rust which does so much damage to the wheat crops, in England *Puccinia glumarum* is the most important species. This appears every season, and in some years in such abundance that the whole of the foliage, and even the ears and grain, become coated with its orange-yellow spores; hence the common name of "yellow rust." Dealing with experiments being carried out to breed wheats resistant to this rust, he states that they offer some reasonable hope of ultimate success. Professor Biffen, in reply to an enquiry as to whether these immune or rust-resistant wheats would prove immune in Canada or Australia, states that so far as it is possible to judge they would be valueless, as in those countries they would be subject to the attacks of other species of rust, and he concludes that in view of the special features to be considered each country will have to solve its own problem of building up ideal rust-resisting varieties.

Produce Export Charges.

Producers who intend shipping produce through the Produce Export Department should pay attention to the scale of charges (published on page xxii. of our advertisements) which has now been revised and covers the coming season. Lamb-shippers will be supplied with full particulars in reference to forwarding consignments to the Commercial Agent on application to the Manager. The new works are now drawing to completion, and all slaughtering will be carried out at Port Adelaide, as the Dry Creek works are closed. There is promise of good prices in London for early shipments.

The Rainfall.

August is a somewhat critical month in the agricultural year, and the fine falls of rain at its beginning and again on the 22nd were most welcome. These two falls—the first of which was chiefly monsoonal and the second antarctic—make up a very creditable total for August, especially in some of the northern districts. The following table shows the rainfall at certain important stations from August 1 to 27, the total fall from January 1 to August 27, and the average fall from January 1 to the end of August:—

Station.	Aug. 1 to 27, 1908.	Jan. 1 to Aug. 27, 1908.	Average to end of Aug.
Hawker	2·39	7·71	8·25
Quorn	2·42	9·01	9·54
Wilmington	3·38	14·59	12·36
Orroroo	1·94	9·15	9·34
Gladstone	3·18	13·60	10·53
Burra	3·16	11·89	12·25
Endunda	2·44	10·63	11·74
Maitland	2·09	15·04	14·82
Adelaide	2·01	16·64	15·01
Strathalbyn	1·61	13·13	13·57
Mt. Gambier	2·05	20·26	22·44
Coonalpyn	1·10	10·52	12·30

In the pastoral districts good rains were also experienced in several places. Thus, Farina had 1·12 in. from August 1 to 27, and Yardea 3·03 in the same period. It now only requires a little mild, warm weather to put growth into both grass and cereals. So far the winter—at least in the central and southern districts—has been distinguished by long and continued cold periods. Frosts were numerous and severe in June and July, and snow appeared on the ranges near Adelaide and in the northern areas.

Dodder on Lucerne and Clover.

Dr. Hiltner, Director of the Munich Agricultural Botanical Institute, reports successful experiments with sulphate of iron as an agent for the destruction of dodder on clover. Badly-affected patches were sprayed with 15-per-cent. and 18-per-cent. solutions of sulphate of iron, with the result that, though the clover in one instance did not recover from the treatment, in other instances, though much discoloured, it sprouted again and made quite as good growth as the untreated clover. Dr. Hiltner recommends the use of a 15-per-cent. solution, and states that the solution requires to be applied with a spray, so that it falls with some force and reaches the threads of dodder attached to the stalks just below the surface. In Cape Colony arsenite of soda at the rate of 1 lb. to 10 gallons of water has been found very effective in destroying dodder without injuring the lucerne. This treatment should be

applied after the affected patches have been mowed fairly close, and not to the plant that is likely to be fed to stock within a few weeks. At the strength mentioned no injury to the lucerne-plant or to the ground will result, as a much stronger solution of arsenic applied to garden-paths has only burnt the tips of the leaves of hardy grasses, and within a couple of months the young grass has been growing again on the ground so treated.

Franco-British Exhibition.

One of the chief aims of the Commercial Agent since his appointment in London has been the bringing of the producer into more direct touch with the large retail distributors in England. With this end in view, Mr. Norton invited the manager of Whiteley's, together with his various buyers, to inspect the South Australian exhibit at the Franco-British Exhibition. These gentlemen expressed themselves extremely pleased with what they saw, particularly with the poultry and fresh and dried fruits.

The Cattle Trade.

Large consignments of cattle are coming every week from the Far North to supply the Adelaide and Melbourne markets. They arrive here in splendid condition after a train journey from Hergott or Farina, and there is always keen competition for them. On August 10 there was a record sale in Adelaide, 1,060 head being disposed of, prices ranging from 28s. to 30s. per 100 lb. Mr. Kidman sends down from his stations about 200 head every week for the local market, and the "Cattle King" dispatches a rather larger number each week to Melbourne, where they have been fetching over £14 apiece. In Adelaide the price for the same animals would be from £12 to £13. The stations from which the stock come are situated in the Northern Territory and Western Queensland.

South Australian Wine Industry.

The Government Statist, having communicated with the wine manufacturers of the State respecting the last vintage, reports that from the returns received he estimates that 2,061,987 gallons of wine were made, against 2,495,434 gallons in 1907, a decrease of 17·37 per cent. Owing to weather conditions, a decrease variously estimated from 15 to 25 per cent. had been expected. The wine in stock on June 30, 1908, amounted to 4,641,622 gallons, against 5,392,245 gallons on June 30, 1907. The quantity and value of wines exported during the year 1907

have only once been exceeded, viz., in 1902. The following are the exports of wine during the last six years:—

Year.	Gallons.	Value.
1902	846,691	£124,916
1903	561,830	94,660
1904	686,159	107,573
1905	718,660	103,138
1906	562,819	99,247
1907	737,664	120,393

Lucerne Pasture for Fattening Pigs.

Throughout the hog-raising States of America lucerne is highly valued, not only for feeding young and store pigs, but also as a part of the ration for fattening. In a recent bulletin issued by the Nebraska Agricultural Experiment Station, some interesting experiments in this direction with pure and grade Duroc-Jersey pigs are recorded. In one experiment with twenty brood sows, from which the pigs had been weaned, a comparison was made between the results obtained by feeding maize in a dry lot, and maize with a five-acre paddock of lucerne. In each lot there were ten pigs, and these were fed for thirty days. The one lot received daily 4 lb. maize for each 100 lb. live weight of the pigs; the other 3 lb. per day and the run of the lucerne paddock. The average gain in weight per pig in the thirty days was 73 lb. in the maize lot and 79 lb. in the maize and lucerne. The pigs on lucerne pasture gained 6 lb. more in the thirty days, and ate 130 lb. less of maize for each 100 lb. gain in weight than did the other lot; while the average profit, after allowing for the value of the lucerne pasture, on each pig was 81 cents more in this lot. Looking at the results in another way, the figures show that for each bushel of maize fed to the pigs on lucerne, the return was \$1.02; while in the dry lot the return was only 71 cents—a difference of 31 cents (about 1s. 3d.) per bushel in favour of the lucerne-pastured pigs. To produce 100 lb. of gain it took 43 per cent. more corn in the dry lot than in the pasture lot. In a further experiment with barley it was found that the results from the feeding of barley and lucerne, as compared with barley alone, were in line with the former experiment, though the gain was not quite so much in favour of the lucerne-fed pigs. The grain in these tests was ground and fed wet. The general conclusion of a number of experiments was that lucerne may be fed with profit to either growing or fattening pigs in almost any form, so long as it does not make up too large a proportion of the ration. When cut and fed as one-quarter of the ration with ground maize it materially reduced the cost of grain and increased the profits.

Apricots Dried and Salted.

Some time ago Governor Rawson called the attention of the New South Wales Department of Agriculture to a table delicacy made in Capetown, called "Mebos," which he thought worth while experimenting with here, as apricots are grown to perfection in many parts of the State. Lately Miss Rawson has obtained from the Cape a recipe for the process, which she has kindly forwarded to the Department. The recipe, which is given below, is very simple, entailing no more trouble than ordinary dried apricots. Take soft ripe apricots, lay them in salt-water (almost 2 oz. of salt to a quart bottle) for a few hours. Then lay them on a mat to dry in the sun; the next day press them between the hands to flatten, and let the stones come out. The following day repeat the process. At the Cape it generally dries, and becomes "Mebos" in three or four days in the sun; but, if the weather should be damp, they might be dried in heated rooms or in a cool oven. To crystallize the "Mebos," lay them in limewater for five minutes, till they feel nice and tender; take out, wipe dry on a soft cloth, and rub coarse crystallized white sugar well into each; take $1\frac{1}{2}$ lb. of sugar to 1 lb. of "Mebos." Pack closely, with lots of sugar in between, in jars that will cork well.

Frozen Meat in England.

It is most discouraging to all parties engaged in the Australasian frozen-meat trade (says *Cold Storage* on July 16) that after twenty-eight years of the business the condition (no question of quality) of much of the meat arriving from Australia and New Zealand should be defective. But few people outside shipowners, consignees, and the underwriting interests are aware of the extent of this damage—certainly the shippers on the other side are not. What happens is that at some stage the valuable meat is subjected to rough and improper handling, and that consequently when it reaches the consignees it is misshapen, dirty, off colour, with broken shanks, and in other ways in bad condition. Shippers may not know it, but they pay for all this in insurance premiums. No one seems to know precisely where the damage takes place; "soft shipping" may cause some of it, the "working tiers" is said to be a frequent cause of it, and there is the handling after the meat leaves the ship. It is certainly in the interests of all parties to the trade that some drastic steps should be taken to stop or largely abate this nuisance.

"Penicillaria" Again.

Almost every other year, during the past fifteen years or so, information is sought from the Agricultural Department respecting a much-advertised plant; "Penicilare," "Penicillaria," "World Wonder

Forage Plant," and other names are applied to it. It is claimed to be the best fodder-plant in the world, grows in poor soil, and in any climate, produces ninety-five tons of green fodder per acre, resists drought, flood, cold, and heat, and so on. As it produces as many as seventy-six stalks from one seed, and each stalk produces a large seedhead, we would naturally expect that a fodder-plant of such surpassing merit would—after being advertised for so many years—be grown everywhere; yet, strange to say, it is hardly ever mentioned except by people having seed for sale. And, further than this, the seed is, in spite of the immensely productive qualities, so scarce that it is sold at 2s. 6d. for a small packet, and "not more than two packets will be sold to one person, as the supply is limited," to quote the advertisements. It may, however, be mentioned for the benefit of those desiring to try this wonderful plant that Pearl Millet, which can be purchased from any seedsman at 1s. 3d., is *Penicillaria*; but it is not the wonderful plant that it is claimed to be.

Poultry Meat-meal.

The Produce Export Department has, under instructions from the Minister of Agriculture, undertaken the manufacture of meat-meal for fowls. One lb. of this meal will contain three and a half to four times the amount of albuminoids contained in fresh, lean beef; 3 lb. made into soup will suffice to mix with the soft food of 100 fowls or ducks, and should at most be given three times in one week, four times the next, then three times—not more. This is a food, a flesh- and egg-maker, not a forcing-food. It has excellent effects when used thus, and may be given continuously, and there are none of the dangerous elements present in green-bone, blood-meal, etc. The meat-meal will be put up in convenient packages of 10, 28, and 56 lb., and the price will be under 2d. per lb., with a reduction to bulk-purchasers, either in large packages or in assorted weights. It is also good to mix with dogs' food, and is specially suitable for the training of greyhounds.

The English Blackbird.

Some years ago, when the misdirected enthusiasm of some lover of the English blackbird resulted in its introduction to South Australia, it was freely stated that the bird was insectivorous and harmless to cultivated crops. Of recent years the blackbird has increased considerably in numbers, and more than one fruit-grower who formerly protected this handsome songster now has a very different opinion of his habits. There are still a number of orchardists to whom the song of the black-

bird is sufficient justification for his protection. These may be interested in the following extract from an address given before the Royal Horticultural Society of Great Britain, last October, by Cecil H. Hooper on "The Commoner Birds of our Garden: their Habits and Foods." He says:—"This sweet singer is a shy bird, generally seen singly or in pairs, very seldom in flocks. It is considered 'the prince of fruit-thieves,' eating green and ripe strawberries, red currants, gooseberries, raspberries, soft-coloured and best apples, cherries, plums, tomatoes, mulberries, figs, loganberries, and more rarely black currants; it also picks holes in late pears. The male has a jet-black coat and orange bill; the female is of a sooty colour and dusky-brown bill. In taking fruit from bushes this bird keeps near the ground and, if disturbed, gets up with a loud chattering cry."

When Seed or Soil Inoculation is of Benefit.

If a crop is thriving it indicates that either the soil is plentifully inoculated with the bacteria necessary to produce nodules on that particular species, or else that the soil already contains an abundant supply of nitrogen upon which the plants can live. In either case the use of artificial cultures would be of little if any benefit. On the other hand, if the crop fails to thrive, and upon examination no nodules are found on the roots, it is an indication that the culture should be used. Sometimes the use of the culture proves beneficial to the crop when a few nodules are present. Of course, failure to thrive may be due to other causes than lack of nitrogen. The soil may lack available potash or phosphoric acid, or may be deficient in lime. Inoculation cannot and does not remedy this. When it is intended to sow seed of a legume which never has been grown upon the soil, inoculation of the seed should prove beneficial. This is true even if other legumes have been grown on the same soil, as the bacteria forming root nodules on one species do not necessarily form nodules on the roots of other species. If soil once becomes thoroughly inoculated as indicated by a successful crop and the presence of numerous nodules, the use of artificial inoculations with later seedlings is considered unnecessary if a three-year to five-year rotation is followed. It should be definitely understood that the use of artificial inoculation with bacterial cultures will in no way compensate for carelessness in the selection of seed, preparation of soil, or subsequent care of the crop.—*Ontario Department of Agriculture.*

Strawberry Clover.

Speaking of strawberry clover (*Trifolium fragiferum*) *The New Zealand Farmer* says:—"It has obtained a fair hold in one or two districts near Auckland, but cannot be said to have a general distribution. It

grows particularly well on damp lands, and is said to be a plant that does well on salt marshes and meadows that are not too alkaline. If this is correct, there is hardly a coastal district in New Zealand where it could not be put to good use as reclaiming agent. It gives a large amount of feed which has great fattening qualities." Strawberry clover grows in our hills, although not nearly so common as *T. tomentosum*, which has similar but more downy heads. It might be worth while for those who have saline meadows to try the effect of sowing a little strawberry clover.

Phylloxera in New South Wales.

The Viticultural Expert to the New South Wales Agricultural Department has recently called attention to the alarming spread of phylloxera in the vineyards of that State. He has reported to the Minister that unless prompt action is taken to check the increase of the pest, the production of grapes in the State will certainly become extinct. There seems no room for doubt that phylloxera has been increasing almost unchecked in New South Wales for many years. A very long time ago a Board was brought into existence for the purpose of dealing with the pest. The Act under which the Board was constituted provided for the rooting up of all vines in vineyards found to be affected, and a scale of compensation to owners was part of the scheme. In the County of Cumberland, and in other districts, certain vines were uprooted and destroyed, and in many cases the areas were replanted; but if, as was unlikely, the phylloxera was stamped out for a time in these vineyards, it has speedily re-asserted itself. In view of the serious position of affairs in New South Wales, and the fact that the infested area in Victoria is rapidly increasing, it will be admitted that the precautions taken to prevent the introduction of this dreaded pest into South Australia are fully justified. Though the regulations occasionally cause some little inconvenience to importers, the risk of introducing the phylloxera is too serious to permit of any relaxation of our regulations.

A Veteran Stock-manager.

Mr. Donald Forbes, cattle manager to the Angas family, who has returned to the State after a visit to England, saw several changes since his last trip to the old country fourteen years ago. He attended four of the great agricultural shows and inspected several famous studs. He thinks the old breeders are on safer lines than the new generation, who are beginning to use any bull, irrespective of pedigree, provided he is robust. The type of the Bates Shorthorn has deteriorated to some extent by the introduction of a Scotch element intended to provide new

blood. Mr. Forbes suggested the re-importation of some of the best animals from Point Sturt in order to invigorate the English herds and re-establish the type, but the laws of Great Britain forbid any oversea introduction of live cattle except for immediate slaughter. This is done on the plea of excluding disease. There is nothing in the world to beat the verdant English pastures, but the way in which the young stock are housed appeared injurious to the visitor. They are kept in small cribs for the first eight or nine months, and do not get enough exercise, fresh air, and sunlight for their health.

“*Blastophaga*” or Fig-wasp.

Mr. C. P. Lounsbury, Government Entomologist to the Cape Colony Agricultural Department, reports that the *Blastophaga*, the insect which causes the fertilization of the fig of commerce known as the Smyrna fig, has been successfully introduced on a small scale from California. Quite a number of the insects have emerged from the figs sent from there, and these have freely entered the figs on the trees growing in the College orchard at Elsenberg. This news will be received with considerable pleasure by those interested in the possibility of growing the Smyrna fig for drying in this State, as several attempts to introduce the insects direct from California have been made by Mr. T. B. Robson, of Hectorville, but have proved unsuccessful. Should the *Blastophaga* increase to the extent expected in Cape Colony, there should be but little difficulty, with the co-operation of the authorities in that State, in introducing it thence into South Australia.

Late Fruiting of Northern Spy Apples.

The Northern Spy apple is one of the favourite varieties in North America, and in Canada it is, according to the official reports, more largely grown than any other, though closely pressed by the Baldwin. There, as in South Australia, it has the serious disadvantage of coming into bearing at a much later stage than most other apples. Compared with the Baldwin and Ben Davis, it is stated that the Northern Spy takes six years longer to come into full bearing. The chief of the Canadian Horticultural Section, in his report for 1907, states that it has been proved beyond a doubt that topworking the Spy on two- or three-year-old stocks of certain hardy varieties results in the trees coming into bearing a number of years earlier. No mention is made of the pitting defect so characteristic of the Spy in this State, but it would certainly be interesting to test this method of bringing into earlier bearing varieties such as Nickajack, Northern Spy, and others which are so late in coming into a fruit condition. For this purpose a variety like the Irish Peach, which is naturally somewhat stunted in growth and an early bearer, besides being practically blightproof, might be used as the stock.

A New French Wheat.

A series of experiments has been made in Norfolk, England, with certain wheats of exceptional quality produced by Mr. Vilmorin, of Paris, the most famous of French seedsmen. "At Burnham Overy," says the London *Daily Mail* of June 20, "is a large field of 'Sensation'—a wheat now heard of in England for the first time—which has been in full ear for ten days or so. Whatever weather we get it will be ripe in six or seven weeks, a fortnight before English wheats sown at the same time under similar conditions. The straw is wonderfully strong and the ear full. The experiments seem to have proved:—Firstly, the fact of this early maturity, which may mean the salvation of a harvest; secondly, that the transference of a grain from one country to another adds very largely to its quality. Farmers in the north of France are re-purchasing some of these Anglicized French wheats for seed purposes. They have visited Norfolk and seen with delight the success of this latest 'Sensation.' Even on late land the forwardness is astonishing. The kernel is very much larger than in the popular British wheats, the straw firmer and not too long, and the fact of the earlier maturity cannot be doubted."

African Boxthorn as a Sand-binder.

Mr. Thomas Fraser, of Hectorville, writes in reference to the article by Mr. W. Gill, Conservator of Forests, in the June issue of *The Journal* on the drifting-sand problem in which African boxthorn (*Lycium afrum*) is recommended as a sand-binder. "I have no doubt that it will do that most effectively, but if Mr. Gill were to take a vote of the landholders in this district I am quite sure that the majority would vote for putting *Lycium afrum* on the noxious-weeds' list. Further, I am of opinion that if one wishes to provide an impregnable protection for our rabbits, he could not do better than cover the sandhills with boxthorn."

Another correspondent writes:—"I fully agree with Mr. Gill that African boxthorn is a most effective sand-binder, and will thrive on poor, sandy land. I have had considerable experience with this plant, and while recognizing its sand-binding qualities, I would nevertheless very strongly warn landholders against planting it, except perhaps as hedges, where it can be kept within bounds. Let anyone make a careful examination of the sandy land around the Reedbeds, Glenelg, Somerton, and Brighton, and he will see considerable patches of ground which have been completely taken possession of by the boxthorn. The birds are very fond of the fruit, and by this means the seeds are distributed over a wide area. Where the land is closely grazed the plants rarely assume large proportions, but if left untouched for a comparatively short time, they get beyond control, and afford effective harbour for vermin of all descriptions."

Enquiry Department.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, etc., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. Enquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence for this department should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

"RED SPIDER" ON APPLES AND PLUMS.

"P.A.G.S.," Wilmington, asks for treatment to destroy "red spider" on apple- and plum-trees.

Answer:—"Kerosene emulsion provides an effective check upon this pest; it should be applied early in the spring-time—that is, within the next few weeks—taking care to drench the egg-masses. The proportions of kerosene emulsion made by the standard formula are—1 gallon of kerosene, 1 lb. of soap, and 2 gallons of water, and while the solution is boiling hot add the kerosene and churn it violently with a syringe, lifting it from one vessel to another for about $\frac{1}{4}$ hour or 20 minutes until it turns to a creamy mass. One part of this stock-solution should be used in each 10 parts of water while the trees are bare of leaves."

PEACH APHIS.

"A. McD." wishes to know how to prevent injury to peach-trees by small black insects which attack the young shoots in great numbers, causing the leaves to fall off.

Answer:—"This is the well-known peach aphis. The most satisfactory treatment is to cover the trees with an air-tight tent and fumigate with hydrocyanic acid gas. Where this cannot be done, spraying with a tobacco and soap solution should be adopted. This solution is made by steeping 1 lb. waste tobacco for 24 to 36 hours in warm water, then strain and add to 2 gallons of water in which $1\frac{1}{4}$ lb. of common soap has been dissolved. Care must be taken to apply this spray thoroughly to all parts of the tree. As the aphis increase very rapidly, and it is practically impossible to reach all at one spraying, the operation should be repeated in three days' time or even less. The British Tobacco Company of Australasia advises that ground waste tobacco will be available in the course of a week or two in $\frac{1}{2}$ cwt. bags, the price being about 6s. per bag. The unground stems can be purchased from various seedsmen and others."

MANURES FOR THE SOUTH-EAST.

"W.F.O." asks how much superphosphate per acre should be applied to a cereal crop at Kalangadoo, the soil being a sandy loam over a clay subsoil; also which crop—wheat, oats, or barley—takes most out of the land.

Answer:—"McConnell's Agricultural Notebook gives the following table of constituents of barley, oats, and wheat:—

	Nitrogen.	Phosphoric Acid.	Potash.
Barley—40 bush.	35 lb.	16·0 lb.	9·8 lb.
Grain straw—2,447 lb. ...	13 lb.	4·7 lb.	25·9 lb.
<hr/>			
Total Barley	48 lb.	20·7 lb.	35·7 lb.
Oats—grain 45 bush. ...	38 lb.	13·0 lb.	9·1 lb.
Oats—straw 2,835 lb. ...	17 lb.	6·4 lb.	37·0 lb.
<hr/>			
Total Straw	55 lb.	19·4 lb.	46·1 lb.
Wheat—grain 30 bush....	33 lb.	14·2 lb.	9·3 lb.
Wheat—straw 3,158 lb....	15 lb.	6·9 lb.	19·5 lb.
<hr/>			
Total Straw	48 lb.	21·1 lb.	28·8 lb.

It will be seen that the oat crop takes most out of the soil, there being comparatively little difference between wheat and barley, except that the latter makes a heavier demand on the potash. These figures, of course, are averages of a number of analyses. It is not possible to give a definite reply to the query as to best quantity of superphosphate to use. Indeed, it is open to question whether in a wet district super is the best manure to use; possibly some less soluble phosphate would be better. The least quantity for a cereal crop in this district should be 1 cwt. per acre.

PIG COMPLAINT

"F.B.," Meningie, writes:—"I have two litters of young pigs which are fourteen days and nine days old respectively, the tails of which are sore, beginning at the butt, and then gradually going to the tip. A few of the oldest have dropped off. Will you kindly let me know through *The Journal* the cause and a cure?"

The Veterinary-Surgeon replies:—"Your pigs are suffering from cutaneous gangrene, which is probably due to imperfect nutrition and lack of vitality. Feed the sows liberally: use plenty of dry bedding in the styes; apply to the sores carbolized vaseline or iodine ointment."

WATTLES FOR PINNAROO.

"W.N.," Lameroo, wishes to know the best variety of wattle to grow in that district.

The Conservator of Forests replies:—"Wattle culture in the Pinnaroo district will probably be purely experimental. The broad-leaf wattle (*Acacia pycnantha*) is the only one likely to grow there. It may attain a fair size and seem a success, but the probability is that it will contain too little tannic acid to be commercially valuable, as was the case with those grown at Emu Flat some years since."

CONDITION POWDERS FOR HORSES.

"W. M. S." writes:—"Will you please give me a recipe for condition powder for horses, and can you recommend a treatment for saddle-gall? The gall has been on the horse for several months; I have bathed with hot water and lanced when soft, afterwards applying carbolic oil. The gall is now hard."

The Veterinary-Surgeon replies:—"Good food, suitable stables, and 'elbow-grease' in the shape of good grooming are the best condition powders for horses; drugs should not be used to attempt to improve their condition. More animals are killed in this State by so-called medicines than die from injuries or diseases. For the saddle-gall apply the following:—Hyd binoid, 2 drams; vaseline, 1 oz.; leave it on for twenty-four hours, then wash off with soap and water. Repeat washing morning and night for a week."

BLOOD IN THE MILK.

"Dairyman," Mount Gambier, reports that a cow, six years of age, gives milk discoloured with blood from each of her teats. It is four weeks since calving, and the cow looks healthy and in good condition. He wishes to know the reason and what treatment to follow.

The Veterinary-Surgeon states that injuries (by kicks, horning by other cows, etc.), constitutional troubles, rupturing of the delicate blood-vessels in the teats during the act of milking, etc., will all cause the cow to give blood in the milk. The fact that all four teats are affected points to constitutional troubles. The treatment of such cases is far from being satisfactory; what will prevent the milk escaping has a tendency to dry off the milk. Try the effect of giving a teaspoonful of powdered alum well mixed in chaff and bran morning and evening. Will be glad to hear again after a few days of this treatment. [This correspondent omitted to give his name and address; all enquiries should be signed, and if desired a *nom de plume* under which the answer is to be given may be indicated.—ED.]

"FOUNDERS" IN HORSES.

"P. H. Evans" wants to know:—1. "What is 'founders' in horses' feet and its cause?" 2. "Will a stallion suffering from this ailment be liable to transmit it to his progeny?" 3. "Is it contagious?" 4. "Is it curable?" 5. "What is the proper treatment?"

The Veterinary-Surgeon replies:—"1. The causes of laminitis ('founders') are very numerous. The principle cause in draught stallions is forced feeding for Show purposes. 2. No. 3. No. 4. Yes; in the early stages. 5. Depends on the cause. If through forced feeding, put the affected animal on a restricted diet, and stand in a trench filled with cold water. If a valuable horse, call in the services of a qualified veterinary-surgeon."

The Roseworthy Agricultural College Flock in 1907-08.

By ARTHUR J. PERKINS, *Principal, Roseworthy Agricultural College.*

(Continued from page 25 of the August issue.)

Stubble Pasture.

I have separated stubble-grazing from the various forms of pasture open to Lower North farm sheep, because of the special features it presents. This form of pasture is invaluable to the farmer, and I doubt whether its grazing-value is altogether realized. It falls in most auspiciously with the general arrangements of the normal season, at a time when spring feed has practically disappeared from the fields in ordinary pasture. It consists essentially of fallen grain, chaff, broken straw, loose hay, dry weed growth, seeds, burrs, and such summer-growing weeds as wire-weed, thistles, stinkwort, etc. Some farmers have conceived the excellent idea of further improving the value of stubble pasture by sowing in autumn with their cereals a few pounds of lucerne seed to the acre. The lucerne grows in the shelter of the cereal crop, and becomes available for grazing when the latter has been removed. In a limited sense, it is a return to the old English practice of sowing clover in a barley crop, although the crop of hay that is thus rendered available in the following season is not to be thought of under Lower North conditions. I have heard it stated that the lucerne is sown through the drill mixed with the cereal grain. This appears to me a very wasteful practice, having little to recommend it, except the fact that it realizes a certain amount of economy of time and labour. It would be more rational to broadcast the lucerne seed behind the drill, and then harrow it in lightly. Lucerne seed drilled in mixed with ordinary grain cannot possibly be distributed at all regularly over the ground, added to which is the fact that the greater portion of the seed must inevitably be buried too deeply. I foresee, however, one difficulty that must tend to limit the benefits that attach to this practice, namely, the more or less complete exhaustion of grazing-areas at the time available, and the imperative necessity to concentrate flocks and herds on the stubbles so soon as they are free. In order to secure the maximum benefit from such a practice, it would be necessary, for a few weeks at all events, to leave the stubbles wholly untenanted. Where this cannot be done much benefit cannot be expected from the presence of the lucerne in the field.

Table III. shows the areas open to stubble pasture in the summer

months of 1907-08 to have been represented respectively by the following figures:—

October	...	...	...	8 acres of stubble pasture
November	...	...	...	47 do.
December	...	...	...	178 do.
January	...	...	...	244 do.
February	...	...	...	231 do.
March	...	...	...	173 do.

This represents a general average of 147 acres for each of the six months concerned. In order to form some adequate idea of the actual grazing-value of these stubbles, let us examine the results for each of the several fields concerned.

Field Ebsary's A.—60 acres of barley stubble grazed continuously from December 7 to February 12, which with heavy stocking represents the practical time limit of stubble-grazing. The carrying-capacity of the field over this period is shown below:—

December	...	...	25 days' grazing averaging	5.68 sheep to the acre
January	...	...	31 do.	3.25 do.
February	...	...	12 do.	5.23 do.
Dec. 7 to Feb. 12	...	...	68 do.	4.50 do.

Field Ebsary's B.—71 acres of cereal hay and oat stubble, grazed from November 16 to March 17. Carrying-capacity of this field over this period is shown below:—

November	...	...	15 days' grazing averaging	2.99 sheep to the acre
December	...	...	31 do.	0.42 do.
January	...	...	31 do.	1.87 do.
February	...	...	29 do.	1.52 do.
March	...	...	17 do.	4.08 do.
Nov. 16 to Mar. 17	...	...	123 do.	1.87 do.

Field Ebsary's C.—36 acres of wheat stubble grazed from December 9 to January 25. Carrying-capacity of the field over this period is shown below:—

December	...	...	23 days' grazing averaging	4.61 sheep to the acre
January	...	...	25 do.	4.56 do.
Dec. 9 to Jan. 25	...	...	48 do.	4.58 do.

Field No. 6B.—22 acres of wheat stubble grazed from January 11 to February 2. Carrying-capacity of the field over this period is shown below:—

January	...	...	21 days' grazing averaging	6.65 sheep to the acre
February	...	...	2 do.	10.91 do.
Jan. 11 to Feb. 2	...	...	23 do.	7.02 do.

Field No. 6c.—23 acres of barley stubble grazed from December 5 to March 31. Carrying-capacity of this field over this period is shown below:—

December	...	...	27 days' grazing averaging	9.61 sheep to the acre
January	...	...	31 do.	5.41 do.
February	...	...	29 do.	7.61 do.
March	...	...	31 do.	1.97 do.
Dec. 5 to Mar. 31	...	...	118 do.	6.01 do.

Field No. 6D.—36 acres of wheat stubble, grazed from December 24 to March 31. Carrying-capacity of field over this period is shown on page 113.

December	...	...	8 days' grazing averaging	5.05 sheep to the acre	
January	...	...	31 do.	4.69	do.
February	...	...	29 do.	2.78	do.
March	...	...	31 do.	0.81	do.
Dec. 24 to Mar. 31	99		do.	2.94	do.

Field No. 5B and C.—75 acres of wheat stubble, grazed from January 28 to March 31. Carrying-capacity of field over this period is shown below:—

January	...	...	4 days' grazing averaging	1.07 sheep to the acre	
February	...	...	29 do.	7.50	do.
March	...	...	31 do.	8.26	do.
Jan. 4 to Mar. 31	64		do.	7.47	do.

Field No. 1.—12 acres of ensilage stubbles, grazed from October 23 to December 8. Carrying-capacity over this period is shown below:—

October	...	...	9 days' grazing averaging	5.08 sheep to the acre	
November	...	...	30 do.	5.08	do.
December	...	...	8 do.	11.65	do.
Oct. 23 to Dec. 8	47		do.	6.20	do.

This then completes grazing-results of our principal stubble fields. These results may be summarized as follows:—

October	...	8 acres available carried average of	3.88 sheep over 9 days	
November	...	47 do.	do.	3.52 do. 30 days
December	...	178 do.	do.	3.94 do. 31 days
January	...	244 do.	do.	3.54 do. 31 days
February	...	231 do.	do.	4.72 do. 29 days
March	...	173 do.	do.	4.93 do. 31 days

That is to say, in the aggregate, that in 1907-08 the available stubble area, averaging 147 acres for $5\frac{1}{3}$ months, showed a grazing-value equivalent to 4.19 sheep to the acre. It should be added that in this general average are included a certain number of cattle that were partly fed, and that from March 28 it was found necessary, in the case of sheep, to supplement grazing with a mixture of chaff and molasses.

The Grazing-value of Ordinary Pasture under Lower North Farming Conditions.

I have already explained what meaning I attach in this Report to the term "ordinary pasture." It represents, as has already been stated, the natural pasture offered by fields that are lying out, and excludes therefore stubble pastures, bare fallow-grazing, and sown forage crops of any description. I wish now to proceed to an examination of some questions affecting the economic aspect of ordinary pasture under Lower North farming conditions.

Is there any absolute need to leave out as ordinary pasture any important fraction of a farm the principal operations of which concern cereal crops and sheep? And if not, how ought land to be disposed of to meet the exigencies of the case? In these days of ever-rising land values, we have here two questions that must loom large in the minds of those farmers who are beginning to turn their attention to sheep. Are sheep going to curtail the area at present allocated to cereals, and if not, how is it possible adequately to provide for the growing requirements of a large flock? I cannot pretend to deal definitely and finally

with any one of these questions; possibly, to some extent at all events, their solution is beyond the competence of one who, whilst immersed in the details of purely experimental work, is personally unaffected by temporary errors of judgment. I am inclined to believe, however, that some of our experimental results will help to throw a certain amount of light on these questions, the economic importance of which cannot be over-stated. I propose, therefore, discussing these data to the extent that my limited competence will admit of; and whilst I can vouch for the accuracy of the data, the inferences that are drawn from them I must leave to the judgment of others to endorse or reject.

In Tables IV. and V. I have summarized data having reference to the live-stock carrying-capacity of areas under ordinary pasture in 1907-08.

TABLE IV.

Showing Individual Live-stock Carrying-capacity of Principal Fields under Ordinary Pasture in 1907-08, expressed as Sheep per Acre.

Fields.	Field No. 3.	Field No. 5A.	Field No. 7A.	Field No. 7B.	Field No. 8.	Field No. 16.	Nottles.	The Island.	Flett's.	^{Wet A.} Dahlitz.
Areas.	43 acres.	53 acres.	20 acres.	22 acres.	22 acres.	60 acres.	220 acres.	190 acres.	160 acres.	43 acres.
Equivalent number of sheep to the acre.										
1907.										
April	0.67	0.69	1.07	3.47	3.44	1.98	1.16	0.35	1.44	—
May	2.80	0.69	8.18	1.72	5.76	2.52	1.23	1.19	1.17	—
June	3.28	5.58	6.61	1.23	4.82	1.07	1.30	0.84	0.59	—
July	5.69	—	—	6.24	3.78	4.37	0.68	1.18	1.32	—
August	6.38	—	—	6.23	7.33	3.70	1.05	2.33	1.35	—
September	5.37	—	—	7.29	7.75	2.90	0.16	2.20	—	—
October	5.93	—	—	0.54	3.64	2.77	1.77	—	—	—
November	2.26	—	—	1.86	3.32	4.59	2.18	—	—	1.87
December	1.98	—	—	2.12	1.78	3.42	0.72	—	—	0.96
1908.										
January	3.72	—	—	0.46	nil	0.61	0.09	—	—	nil
February	1.13	—	—	2.85	0.92	2.55	0.29	—	—	nil
March	3.61	—	—	2.80	4.29	2.19	0.18	—	—	2.31
12 Months	3.59	—	—	3.06	3.91	2.73	0.90	—	—	—

In Table IV. is shown the individual stock-carrying capacity of the principal fields used by us as ordinary pasture in the 1907-08 season. For each month and for each field I have indicated the number of sheep grazed to the acre; in addition, for every field used as ordinary pasture throughout the year I have shown what eventually proved to be the average carrying-capacity of the field for the full season, or 12 months.

Fields No. 5A, No. 7A, The Island and Flett's, were available to grazing only in the opening months of the season. Subsequently to this they were fallowed, and therefore withdrawn from ordinary pasture. Dahlitz, on the other hand, as has already been indicated before, was in the early part of the year under rape and barley, the grazing-value of which will be discussed later on.

In last year's Report I had occasion to comment on the remarkable stock-carrying capacity of two of our fields, which are again referred to in Table IV. for the present season, viz., Fields No. 3 and No. 16. In 1906-07 Field No. 3 was sown to rape, and as I showed last



A "MURRAY" MERINO RAM.

year carried an average of $3\frac{1}{2}$ sheep to the acre for the whole year. In the present season—1907-08—Table IV. shows that the same field, when used as ordinary pasture, carried again 3.59 sheep to the acre for 12 months.

Field No. 16, on the other hand, was in 1906-07 the stubble of a barley crop, over the surface of which lay scattered much grain that had been lost in harvesting-operations. The carrying-capacity of this field reached the remarkable average of $4\frac{1}{3}$ sheep to the acre for 12 months. Table IV. shows that this field carried in 1907-08, whilst treated as ordinary pasture, only 2.73 sheep to the acre. Its grazing-value, therefore, was considerably higher in the year immediately succeeding the barley crop than it was as ordinary pasture in the second year of grazing.

As further bearing on the value of barley crops to the pasture immediately succeeding them, we have another example in Table IV. This is given in the 1907-08 grazing-results of Field No. 8. As with No 16, the soil of this field is shallow, light, and dusty, and more or less thickly coated with that travertine, limestone rubble, so characteristic of the South Australian mallee. Field No. 8 was under barley in 1906-07, and in the year following, as shown in the table, carried the equivalent of 3·91 sheep to the acre for 12 months, the highest individual average for the season. From these two years' results, therefore, I think we are justified in concluding that in this district, when light limestone land is sown to barley, one may anticipate excellent pasture in the year following.

Before leaving Table IV. I wish to state that, with the exception of Nottle's, which was more recently purchased, all fields wholly used as ordinary pasture in 1907-08 form part of the old original College Farm. They have, therefore, been heavily dressed with phosphates over a period of 25 years or thereabouts; and their present high stock-carrying capacity I attribute very largely to this fact. Nottle's, on the other hand, dressed only comparatively recently with phosphates, does not equal the carrying-capacity of the fields of the old farm; and this fact holds good for all the more-recently purchased fields.

TABLE V.

Showing Average Live-stock Carrying-capacity, expressed as Sheep per Acre, of total area under Ordinary Pasture in 1907-08.

Months.	Area Available.	Average number of livestock Grazing Expressed as Sheep per
	Acres.	Acre.
1907.		
April	806	1·15
May	807	1·67
June	814	1·66
July	745	1·83
August	660	2·48
September	578	2·12
October	390	2·46
November	426	2·55
December	426	1·40
1908.		
January	426	0·55
February	426	0·72
March	426	1·68
12 months	578	1·68

In Table V. we see the total area in ordinary pasture, together with its average sheep-carrying capacity, over the different months of the 1907-08 season. It will be noted that whilst we opened with 806 acres available, we closed with 426 acres, representing a general average for the 12 months of 578 acres, the average sheep-carrying capacity of which proved to be 1·68. Portion of the area, therefore, was represented by land lying out merely temporarily, and to be utilized later on in the ordinary routine of cropping-operations: whilst another portion was represented by fields deliberately left out of the year's scheme of culti-

vation, and reserved for ordinary pasture, like the more permanent grasslands of moister countries. A study of Table V. will serve to show the system of management adopted for the available ordinary pasture area in 1907-08.

Over the course of April, May, and June, the ordinary pasture area was swelled by that of several fields, which from July to September were to be broken up in the course of fallowing-operations. And unquestionably in the opening months of the season, when the grass is as yet short, and no sown forage crops are available, it is of very considerable advantage to have at one's disposal these fields, the need of which is hardly felt later on. During these months, therefore, the ordinary pasture area is shown as relatively thinly stocked; and, further—although this does not come out in the table—whilst during these months fields lying out for the whole season were spared as much as possible, those about to disappear in fallowing-operations were stocked to their utmost carrying-capacity.

And here it will not be out of place to draw attention to a strong temptation that must at times assail a farmer who has added a flock to his other responsibilities. When late autumn and early winter rains have been withheld, and grass is very backward on pasture-land, the temptation to put off fallowing-operations as late as possible must at times be very great. In the interests of the crops to follow, it is to be hoped that any such temptation will at all times be strenuously resisted. Fallowing-operations in this district, at all events, should tread on the heels of seeding. The great advantages of early fallowing in the normal seasons of the district cannot be too strongly emphasized; it is a theme of which Professor Lowrie never wearied, and what he maintained so strongly seven or eight years ago remains equally true to-day. In ordinary circumstances, little or even no rain will fall on land fallowed late, with the inevitable result that the land never gets back to that state of consolidation and good surface tilth, so essential to healthy wheat crops; probably nine-tenths of the secrets of so-called dry-farming lie hidden in this simple practice. Should grass, therefore, prove scanty in June and July, we must find other means than postponing fallowing-operations for keeping our flocks in good heart.

Towards the end of this first period and over the month of July, crops in need of feeding off will lend a certain amount of relief to ordinary pasture fields. Fields of rape, too, if properly laid out, will contribute to the same end.

From August to November the area in ordinary pasture will be taxed to its utmost capacity. The lambs will be almost full grown, and with their mothers will need an abundant supply of rich nourishing feed. Failing this they cannot retain long prime market condition. On the other hand, the end of fallowing-operations will be in sight, and the area available for ordinary pasture will be reduced to the few fields

left lying out for the whole season; fortunately it is at this stage that our natural grasses are at their best, and our fields capable of carrying the greatest amount of stock. Rape-fields, too, continue to lend a helping hand, although their value will be on the wane; on the other hand, fields of turnips and kale will be in their prime. Finally, it is over the course of these months that the bare follows call for cleaning; we have already seen what their grazing-value represented to us; over them, as has been said, can at this time be spread shorn wethers and dry ewes.

December, January, and February see the fields in ordinary pasture very considerably relieved of live-stock. This is explained by the fact that it is during these months that the cereal stubbles gradually become available for grazing-purposes, and, for a while at all events, the bulk of farm live-stock is concentrated upon them. Incidentally it may be stated that this practice has the effect of checking the growth of "stinkwort," which explains our practical immunity from this weed of late years. Towards the end of this period would come in, too, what summer-fallow crops may have been sown for grazing-purposes.

Last of all comes the closing month of the season—March—possibly the hardest month of all for a farm carrying a flock due to lamb in early April. By this time the stubbles have been more or less completely eaten out, and we are again compelled to fall back on the ordinary pasture area. The grazing-value of the latter in March will depend on the extent to which it will have been spared in the summer months, as also on the special features of the season concerned. With heavy February or early March rains, what at the time remains in the way of dry feed will be irretrievably lost, and the fields more or less useless for pasture-purposes, if not positively dangerous to stock compelled to live on what little they offer. Exceptionally, however, such rains herald the breaking up of the summer, and mild, cool weather may permit of the growth of early grass more than compensating for the loss of dry feed. A few acres of rooted grasses, or perennial fodder-plants of any kind, will in all circumstances prove themselves invaluable at this time of the year. Finally, in the absence of suitable dry feed, or an adequate supply of dry grass, nothing will remain but to handfeed the flock over the critical month of March.

A review of last season's grazing-results may well be followed by an attempt to solve the questions set out in the opening paragraphs of this section of the Report. Does the presence of a flock of sheep on a farm necessarily imply any considerable reduction of the area at present allotted to cereals?

Let us first consider the position of those whose invariable practice it is to place each year one-half of their arable land under crop, whilst the other half is treated as bare fallow. If such a farm has not attached to it a fair proportion of non-arable land, which may be termed "permanent pasture," the difficulty of finding at certain times of the year

standing-room for a flock, let alone adequate grazing-areas, will readily be conceived. And yet, if any value attaches to the results we have hitherto collected, even on such a farm, each year must witness much valuable grazing altogether inadequately utilized. At best, a few working horses and milch cows are allowed to roam over the temporarily vacant areas, a practice hardly calculated to take anything like full advantage of the short feed usually available. Let us assume the position of a 500-acre farm, of which 250 come yearly under crop, whilst the balance is fallowed. Over April, May, and June there should be available for grazing 250 acres, which, if divided into fields of convenient sizes, would in fair seasons carry in comfort a sheep to the acre, and at times considerably more. In July fallowing-operations may be supposed to have reduced the available grazing-area to an average of 200 acres; on the other hand, the feeding off of early crops will more than compensate for any such reduction of area. In August the area will be still further reduced, and we may assume an average of 100 acres to be available for the month; its grazing-value, however, will have considerably increased, varying from 2 to 4 sheep to the acre, according to the season. A certain amount of fallow-grazing will also be open over the greater portion of this month. By September, however, the grazing-area will have completely disappeared, and with the exception of a certain amount of fallow-grazing the flock will be without standing-room until December, and harvesting-operations shall have set free some portion of the stubbles; when available, the latter will without difficulty carry from 1 to 2 sheep to the acre to the end of March. Hence, if it were not for a period of three months, extending from September to November, a 500-acre farm, one-half under crop and the other in fallow, could with good management carry a flock of 250 sheep. If to such a farm were added a small area of non-arable permanent pasture, capable when aided by fallow-grazing of supporting the flock over these three months of the year, the solution of the difficulty will have been found. Where such an arrangement is not possible, as when the whole of the farm is arable, some portion of the cereal area must be encroached upon to make provision for a few fields that must lie out from year to year.

This leads us to a consideration of those who bring their land under crop once in three years, practising a rotation that may be expressed as follows:—(1) Bare fallow, (2) wheat, (3) grazing. Where such an arrangement is adopted, I am of opinion that given rational treatment such a farm is capable of carrying, without difficulty, a sheep to the acre over its whole area. Indeed, to realize such a result I do not hold it to be necessary to throw open to grazing for the whole of the year one-third of the area of the farm; one-fifth will usually prove ample for all requirements. Thus a 500-acre farm, with 200 acres under crop and 200 acres in fallow, would need no more than 100 acres open to grazing throughout the year—inclusive of catch crops and special forage crops—to support 500 sheep.

I have repeatedly noticed—although for the present I can give no definite figures to justify the faith that is in me—that as a rule in this district the grazing-value of a field is infinitely higher in the year immediately following a crop than in the grazing-years that succeed it. This is more noticeably the case with fields the soil of which is at all argillaceous and heavy. In this district, therefore, I do not as a rule deem it good policy to leave a field out of cultivation for grazing-purposes for more than one year and never for more than two.

The practice of periodically grazing the arable fields of a farm invariably reacts favourably on the years of cropping that follow. Par-



TYPICAL MERINO EWES.

ticularly is this the case with fields which long and continuous cultivation has rendered more or less foul with weed growth. For the most part these weeds are as much in need of the helping hand of tillage-operations as our most-carefully sown crops. Withdraw this help, and in its place substitute the close-gnawing tooth of the sheep, and the land will cleanse itself readily enough, more readily at times than the most conscientious of bare-fallowing. Indeed, crops raised on land that has been grazed for any length of time are almost invariably clean, which is more than can be said of the average crop raised on fallow-land, on which a crop of similar nature had been raised in the season immediately preceding fallowing-operations. Again, the large quantities of manure left on the surface of heavily-stocked fields exercise the most happy of influences on the mechanical condition of the soil, when the latter comes again under the influence of the plough. This manure will partly, at all events, help to restore to the soil that organic matter so essential to

its fertility, which our perhaps unavoidable practice of bare-fallowing tends yearly to dissipate more and more. On these grounds alone—that is to say, in the sole interest of our future crops—I am not certain but that in the course of time we shall not find ourselves compelled to call in to our aid flocks of sheep to restore some degree of fertility to our exhausted soils; and this altogether irrespective of any direct profit that might perhaps still attach to sheep speculations.

If our grazing-results show anything, it will be admitted, I think, that they throw well into relief the high grazing-value of ordinary farm pasture in the Lower North. For an average area of 578 acres left out of cultivation to have carried successfully over a period of 12 months an average of 1.68 sheep to the acre is no mean achievement; and yet such in summary is the tale told by Table V. I readily admit that in 1907-08 we had in this district the advantage of a relatively good grass season; at the same time, whilst in the same district I have seen seasons considerably leaner, I have also seen others in every respect superior to 1907-08. I have, therefore, little hesitation in describing the carrying-capacity of fields lying out of cultivation on the College Farm as equivalent in normal seasons to not less than $1\frac{1}{2}$ sheep to the acre. The question, therefore, that must next occupy our attention will have reference to the relative values of ordinary pasture and sown forage crops. Is there anything to be gained by breaking up portion, or the whole, of this ordinary pasture area, which will carry at least $1\frac{1}{2}$ sheep to the acre, to place it under specially-sown forage crops that can be grazed? Will in average seasons such forage crops show carrying-capacity superior to that of ordinary pasture, and, what is of equal importance, will they continue available over the whole of the season, and particularly over critical periods of it? And, finally, in the event of their unquestioned superiority, is the latter sufficiently marked to compensate for tillage and seeding expenses, from which ordinary pasture must always remain free? These constitute so many general questions that we shall have occasion to discuss after an examination of the grazing-results of what forage crops were grown by us in 1907-08.

1907-08 Grazing-results of Sown Forage Crops.

In this connection we are able to consider only rape, kale, swedes, and turnips. In future Reports I trust to be in a position to deal with a greater variety of forage crops.

Rape.—In 1906-07 we had sown rape in mixture with rye: in 1907-08 it was sown in mixture with barley. In either year the mixture was treated as a forage catch crop—that is to say, it was sown on the least possible amount of tillage. The field known as Dahlitz was used for the purpose last season. This field is 43 acres in area, and on the whole in a very poor state of fertility, which may serve to account to a certain extent for the unsatisfactory grazing-results of the 1907 rape crop. Hitherto Dahlitz has been known to us as a field of dis-

appointing crop yields; we shall now have to write it a disappointing feed paddock.

Dahlitz was under wheat in 1906-7, and early in April, 1907, the stubbles were broken up with a disc cultivator and subsequently rolled. On April 11 seeding-operations were started, in the course of which the following mixture was broadcasted to the acre:—Rape, 8 lb.; white mustard, $\frac{1}{5}$ lb.; and barley, 60 lb. By April 16 all the seed had been harrowed in.

By the end of May growth was sufficiently forward to admit of grazing, and on May 28 the first flock was brought in the field. With occasional intervals of rest the field was grazed more or less continuously to the end of October. Although this field was grazed subsequently to this throughout the season, what grazing there was cannot be set down to the credit of rape, as in this district with the approach of summer the rape plant practically dies out. Summer- and autumn-grazing in this field, from November forward, I have therefore accounted ordinary pasture, as indicated in Table IV.

The grazing-value of this field is indicated below in Table VI., for each of the months over the course of which the rape was available. Side by side, for purposes of comparison, I have shown what proved to be the average carrying-capacity of the ordinary pasture fields for the same months.

TABLE VI.
Showing Grazing-value of a 43-acre Field of Rape and Barley in 1907, comparatively with Average Grazing-value of Ordinary Pasture Fields over same Period.

Months.	Days Grazing.	Sheep to the Acre.	
		Rape and Barley.	Ordinary Pasture Field (average).
May	4	4.32	—
June	30	2.32	1.66
July	31	1.52	1.83
August	31	2.46	2.48
September ...	30	3.04	2.12
October	31	4.10	2.46
May - October	157	2.73	2 05

Thus, from the results in Table VI. it will be seen that when the cost of putting in the crop is taken into consideration 1907 rape and barley as a sown forage crop does not compare too favourably with average ordinary pasture results; indeed, although in the aggregate, over the period that it was available, the rape crop showed somewhat higher carrying-capacity than the general average of the ordinary pasture fields, it would not have been difficult to single out individual ordinary pasture fields which over the same period were of higher grazing-value to us than the sown rape crop. The truth of the matter is that last year's results are somewhat unfair to rape as a forage crop suited to the district, and cannot be taken to decide finally on its merits. The field in which the rape was sown is of recent purchase, and has hitherto proved very unsatisfactory so far as cereal crops are concerned; and

it is more than probable that it will take many years to raise its stock-carrying capacity to the level of the fields of the old farm. It may be added that in this respect all the recent additions to the College Farm appear to be in the same position.

The results shown in Table VI. appear to me so unfair to rape as a general forage crop that, with a view to correcting any possible misapprehension in the minds of those who are unacquainted with it, I propose giving here results secured with rape in 1906-07 in a field of the old farm, known as No. 3. Here, again, rape was sown as a catch crop on lightly-tilled hay stubbles. As has already been stated, the rape was sown mixed with rye. The area of the field is the same as that of Dahlitz, viz., 43 acres.

This field was not ready for grazing until June 18. Details of its grazing, comparatively with those of Dahlitz in 1907, are shown below in Table VII.:—

TABLE VII.

Showing Grazing-value of a 43-acre Field of the Old Farm Sown to Rape and Rye in 1906, comparatively with that of Rape and Barley in 1907 on a recently-purchased Field.

Months.	Days	Grazing.	1906.	1907.
May	4	...	—	4.32
June	13	...	5.11	—
	30	...	—	2.32
July	31	...	3.85	1.52
August	31	...	6.85	2.46
September ...	30	...	7.32	3.04
October	31	...	9.82	5.47
June - October	136	...	6.93	—
May - October	157	...	—	2.73

The fact that whilst the rape was grazed 157 days in 1907 it has only 136 to its credit in 1906, somewhat spoils the symmetry of the comparison. If, however, we calculate the grazing-value of the rape in 1906 as having extended over 157 days, as was the case in 1907, it works out at almost exactly 6 sheep to the acre—that is to say, more than twice the corresponding grazing-value in 1907. In my opinion, however, not even these figures do full justice to rape as a forage crop. The 1906 growth was certainly superior to that obtained in 1907; but it could not be described as good, or at all events up to what rape is capable of doing under good treatment. We should not forget that in either case rape was put in as cheaply as possible as a catch crop, and that with better treatment—such, for example, as would be meted out to a turnip crop—much better results might be anticipated. Further, whilst on the whole rape is fairly well adapted to Lower North conditions, it must be classed with those crops that give their best results only in the cooler and moister districts, in which a well-grown crop should without difficulty carry from 10 to 20 sheep to the acre over 4 or 5 months. In future years I propose testing the value of more thorough tillage than we have made use of in the past on the carrying-capacity of rape.

Thousand-headed Kale.—In a field of the old farm, known as No.

6A, $28\frac{1}{2}$ acres were sown in 1907 to thousand-headed kale. The stubbles of 1906 ensilage and oat crops were broken up in early April with a stump-jump plough; and although later on the field was on several occasions cultivated, rolled, and harrowed, we never succeeded in making anything like a good seedbed of it. This was extremely unfortunate so far as the kale was concerned, because, as is the case with cabbages, maximum results are secured only on perfect tillage. The kale was drilled in from April 18 to 25 at the rate of 1 lb. of seed to the acre, mixed with $\frac{1}{2}$ cwt. of bonedust. The field was grazed for the first time towards the beginning of September, and thereafter fairly continuously to mid-November. Later on, in January, it afforded another week's grazing.

For reasons that have already been given, the 1907 kale crop was not a well-grown one, and the season's grazing-results failed to do justice to its great value as a fodder crop. I have, therefore, thought it better to include in Table VIII., side by side with the 1907 results, those secured in 1906 under more satisfactory conditions.

TABLE VIII.

Showing Grazing-results from a $28\frac{1}{2}$ -acre Field of Kale in 1907, comparatively with Similar Results from a 20-acre Field in 1906.

Months.	Days' Grazing.	Sheep to the Acre.			
		1907-08.		1906-07.	
September ...	30 ...	5.07	...	17.45	
October ...	31 ...	6.51	...	15.01	
November ...	11 ...	10.65	...	—	
	30 ...	—	...	10.22	
December ...	31 ...	—	...	7.00	
January ...	8 ...	7.76	...	—	
February ...	28 ...	—	...	1.67	
Sept. - Nov.	80 ...	6.66	...	—	
Sept. - Feb.	181 ...	—	...	8.73	

Thus, whilst on the one hand 1907 kale yielded only 80 days' grazing, averaging $6\frac{2}{3}$ sheep to the acre; on the other, 1906 kale yielded 181 days' grazing, or 6 full months, averaging $8\frac{3}{4}$ sheep to the acre. The difference is striking, and tends to show how essential it is to heavy carrying-capacity, that kale receives every attention in the way of tillage. As a forage-plant, the great advantage of kale in districts with dry summers, in which of a necessity it is winter-grown, is that it provides an abundance of succulent feed over the summer months, at a time when the latter is not elsewhere available. And it is in this sense that I look upon it in this district as invaluable for weaning off ewe lambs that are being kept for breeding-purposes; and the fact that in 1907 it did not last beyond mid-November was a considerable loss to us. In ordinary circumstances one may depend on it right into January. In the districts with relatively moist and cool summers, in which kale can be sown in spring and early summer, it can be grown to great advantage for early-winter feed.

Turnips and Swedes.—Everybody has heard what turnips mean to

the farming of moist, mild, summer-growing countries, such as Great Britain and New Zealand. It has been suggested that they might prove, if not of equal value, at least very useful as a forage crop under our conditions of climate. Indeed, when Professor Lowrie visited us in 1906 he publicly expressed his faith in them, and stated that were he ever to resume agricultural operations in South Australia, he would certainly grow turnips. And yet to me the question of the possible value of this crop to us appears complicated with many issues. If it were merely a question of the ability of the turnip to thrive with us under field conditions, the matter would admit of very easy settlement. There is no question but that we can grow very fine field turnips. But after we have grown them, are they worth the expense of the raising? Or do they fill a void in our rural economy that other crops cannot fill to better advantage?

Let us examine why they are so highly prized in some countries, that in the latter we find turnip-fields quite as plentiful as wheatfields. In the first place, they fit in well with the rotations practised in these countries. For in the latter, whilst in general farm economy cereal-growing may not perhaps occupy an altogether secondary position, it does not exceed in importance live-stock operations, which fact gives added importance to all forage crops. And there is no denying the fact that, notwithstanding their relatively low individual feeding-value, turnips when suitably situated, will return phenomenal acre yields. The turnip then is a valuable forage crop, and the circumstances of its growth and cultivation render it a valuable fallow crop—that is, a crop that will help to make the way smooth for another that follows. In the first place, for its own development, the turnip calls for perfect tillage conditions; although I do not forget that in certain countries and in certain circumstances the turnip is at times grown more or less successfully as a catch crop. In the main, however, with the turnip, success depends, first, on good preparation, and, second, on good after-tillage, involving frequent horse-hoeing and even hand-hoeings; hence when properly handled its great value as a fallow- or land-cleaning crop. Thus far the advantages of the turnip as a field crop might appeal as much to us as to the British farmer, could we but succeed in shaking off the nightmare that assails all who attempt to keep clean many acres of turnips coming in the wake of a cereal crop. It is, however, more difficult to see what benefit we can hope for from the turnip's next claim to the British farmer's gratitude: it brings its wares to market when supplies are at their lowest. In other words, under different latitudes, the turnip crop is spring-sown, and altogether a summer-growing plant, yielding an abundance of succulent roots in the winter months, when little else of a similar character is at all obtainable. And, moreover, this root is very largely frost-resistant, and does not call for rapid and early pitting, as is the case with the more delicate mangold. With us—I speak for the districts in which I live—

the turnip can be grown only in the winter, and as such altogether loses its biennial character, running to seed on the first approach of spring weather. Hence this relatively costly crop comes to fruition at a time when we are usually well supplied with feed; and, moreover, it must be disposed of in all celerity, or else it goes to waste. I do not wish it to be understood that I am condemning utterly the turnip as a crop for which I can see no future in this district. Indeed, by growing it on our earliest and lightest fallows, it might possibly fit in well with our



DORSET-HORN RAM.

customary farm routine. Everything will depend on the ability of the turnip to thrive when sown not in autumn, but in winter; in the event of late May or June sowings proving unsuccessful, turnips should yield about a month's good spring feed, which would temporarily relieve the ordinary pasture fields, and perhaps lead ultimately to some slight reduction in their total area. Further, the very heavy stocking which a turnip field always involves will lead to a very satisfactory consolidation of fallows light in character as to their soil.

Last season I devoted $6\frac{1}{2}$ acres of Field No. 6A to turnips (more correctly, 3 acres to turnips and $3\frac{1}{2}$ acres to swedes). The soil of this

field is not well adapted to this type of crop, being too heavy and rich in clay, and to this fact must be attributed relatively poor grazing-results. Turnips and swedes were both sown on April 25, at the rate of 1 lb. of seed to the acre, in mixture with $\frac{1}{2}$ cwt. of bone-dust. Circumstances did not permit of grazing-results for turnips being kept separate from those for swedes. I am, therefore, reduced to giving these results in the aggregate. I may remark, however, that the turnips made on the whole better growth than the swedes.

These $6\frac{1}{2}$ acres of turnips and swedes were grazed for 6 days in September, at the rate of 24.90 sheep to the acre, and 10 days in October, at the rate of 55.91 sheep to the acre. In the aggregate the results are represented by 16 days' grazing at the average rate of 44.28 sheep to the acre. I am under the impression that in suitable soil these results could be very considerably improved upon.

Conclusions of General Forage Crops.

Adverting now to the gist of our original enquiries, is there any advantage in encroaching on our ordinary pasture area with sown forage crops?

I think, if it be insisted that the question be settled by definite results, that it will be found that much depends on the character of individual seasons. Thus there are seasons when the feed provided by our ordinary pasture fields is little short of phenomenal, whilst at other times it is more or less unsatisfactory. We should recollect that in conditions such as ours, which imply that all arable land must be treated as bare fallow at regular intervals, we are doing our very best to cleanse our fields of all adventitious plants, and that those that re-appear year after year in our ordinary pasture areas are there as a result of pure accident, and, as it were, in spite of us; so that it may be said that whilst we leave to chance the task of clothing our ordinary pasture fields, our very actions in another direction are constantly tending to clog whatever benefits might originally have been intended for us. Although, therefore, I hold firmly to the opinion that there is no type of pasture better adapted to the requirements of a flock than the natural feed growing spontaneously in a field lying temporarily out of cultivation, I hold it wise policy, notwithstanding any additional expense that may attach to the practice, to provide a few fields of sown forage crops. These fields will make good any defects in the ordinary pasture area, their carrying-capacity will very rarely fall below the average of the ordinary pasture fields, and in the majority of cases it will be considerably higher.

On these grounds there are two types of crops that are open to us—forage catch crops and forage fallow crops—and of both we may find advantage in availing ourselves. Catch crops will never involve us in much expense; for the most part they will call for no more than slight

early-autumn tillage of cereal stubbles, and the broadcasting of such crops as rape, mustard, crimson clover, sulla, and perhaps vetches, either alone or in conjunction with one of the cereals. Fallow crops, on the other hand, will always involve us in far greater preparatory expenditure, portion of which, however, must be borne by the cereal crop that follows. Some of these fallow crops render necessary early-autumn ploughing, a heavy and laborious task when the land lies hard and dry; of such are kale, kohl rabi, and perhaps turnips. To break up at this time of the year, before the early rains can have softened the ground, land that has been lying out is usually quite out of the question; with the result that one is generally driven back on the more tractable stubbles of the preceding summer. In land of this sort this implies later on in the season a regular invasion of weeds, which must be dealt with, if the forage crop is to be looked upon as a fallow- or land-cleaning crop. Hence at times much expense attaches to the growing of such crops. On the other hand, we have fallow crops that can be sown later in the season, when wheat-seeding operations have been completed; for instance, such as peas, vetches, mustard, and perhaps turnips. With the latter we are in a better position to pick our land, and to clean it somewhat of weeds before seeding. Fallow crops of this kind involve us in less expense than those previously referred to. Finally we have the spring-sown summer crops, such as sorghums, millets, maize, etc.—of greater use on the whole for ensilage-purposes and to dairy cattle than to a flock. My own experience of the spring-sown fallow crops is decidedly unfavourable to them; they succeed but rarely in this district, and contrary to what happens with the winter- or autumn-sown fallow crops, always hamper in its growth the cereal crop that follows.

Whatever is done in this direction, it is as well to recollect that no forage crop can be raised to any advantage that does not dovetail in with the general economy of the farm practice of the district—*per se*, a certain forage crop may have much to recommend it, and yet be of comparatively little value to us, because of the conditions under which we may be compelled to work.

(To be continued.)



Imported Bulls.

Shorthorn and Hereford.

Two English bulls have just been imported by Mr. C. H. Angas for use in connection with his studs at Hill River and Point Sturt. These fine animals, whose portraits are given in this issue, made the voyage to Australia on board the "Commonwealth," in charge of Mr. Donald Forbes, the well-known cattle manager of the late Mr. J. H. Angas and his son. Mr. C. H. Angas and Mr. Forbes selected the bulls after careful inspection of some of the finest herds in England.

"Royal Blanche" was purchased from Lord Fitzhardinge, of Berkeley Castle, Gloucestershire. This grim old castle was severely handled by Cromwell's artillery, and a few centuries earlier it was the scene of the murder of Edward II. under circumstances of peculiar atrocity. Here Lord Fitzhardinge keeps his magnificent Shorthorn herd. "Royal Blanche" is a dark roan bull, calved in April, 1906, sire "Lord Inverness" and dam "Blanche III." He stands on very short legs, and is a beautiful mover, with straight top and bottom lines, fine quarters, magnificent head and neck, good wide chest, and very wide, deep ribs. Mr. Forbes declares him to be, without exception, the finest Shorthorn bull which the visitors saw in England. He has a splendid constitution, beautiful bone, and is as clean in his joints as a blood horse. It is an interesting coincidence that the nucleus of the Shorthorn herd at Point Sturt was purchased at Berkeley Castle by the late Mr. J. H. Angas, and now—thirty years later—his son has obtained from the same source as fine an animal as the famous "Duke of Connaught." The stud at Berkeley Castle is under the care of Mr. J. Peter, and it is principally due to his good management that such a high standard has been maintained. As soon as he is out of quarantine "Royal Blanche" will be sent to Point Sturt.

The Hereford bull was bred by Mr. R. Edwards, of Penbridge, Herefordshire, who thought so highly of the animal that he named it after his stud farm—"Twyford-Lancer." He was sired by "Lively Lad" out of "Boniface." Mr. Edwards does not exhibit his cattle at Shows, but when shown by purchasers in Argentina and America they have been very successful. Mr. Forbes considers that "Twyford-Lancer" would, if exhibited, have beaten any of the Herefords which he saw at four leading English shows. He is a long bull, standing on very short legs, of a beautiful colour, a gay disposition, and a fine constitution. He was two years old in March last. The late Mr. Angas spared no expense to improve his Herefords at Hill River, and they now include some of the finest and most deeply-fleshed specimens of that breed.

Imported Hereford Bull.



“TWYFORD-LANCER.”

Imported Shorthorn Bull.



"ROYAL BLANCHE."

Possibilities of Artesian Irrigation.

Experiments in New South Wales.

In the issue of the *Journal* for November last some account was given of experiments conducted by Mr. R. S. Symmonds, of the Chemical Laboratory in the Sydney Department of Agriculture. In the centre of Australia exists a vast artesian basin, but unfortunately the water obtained from the bores is so alkaline that it cannot be successfully used for purposes of irrigation. Mr. Symmonds contends that the injurious effects of the carbonate of soda can be averted by adding nitric acid, which neutralizes it, the result being nitrate of soda—an excellent fertilizer. On this fertilizer the world is spending about £14,000,000 a year. Almost the whole supply comes from Chili, and recent calculations indicate the year 1923 as the date when the beds will be exhausted.

The pot experiments made by Mr. Symmonds with alkaline soil which had been under irrigation by artesian-water show that wheat sown in such soil produced stunted plants and very few grains, while fine, prolific plants were obtained by adding various percentages of nitric acid to the pots.

In the accompanying illustrations the pots numbered 1 and 5 contain the alkaline soil untreated; Nos. 2 and 6 contain the same soil with the addition of 0·2 per cent. of nitric acid; Nos. 3 and 7 received 0·5 per cent.; and Nos. 4 and 8 received 1 per cent. of the acid.

Subsequently further experiments were made to ascertain the smallest quantity of nitric acid necessary to counteract the poisonous proportions of the alkali. Nine pots were sown with wheat on June 13, 1907. No. 1 contained untreated alkaline soil from Moree; No. 2 was treated with 0·002 per cent. nitric acid; No. 3 with 0·004 per cent.; No. 4 with 0·008 per cent.; and so on up to No. 8; No. 9 received 0·25 per cent. On September 13 the plants in No. 1 had made very little progress, and remained practically stationary after that date; but all the plants in the treated pots grew surprisingly. No. 2 contained ears $3\frac{1}{2}$ in. long. On October 14 all the plants in the treated soil looked remarkably well. The ears of Nos. 6, 7, 8, and 9 were from 5 to 6 in. long; No. 9 contained 40 ears—that is, 10 ears from each plant, four plants being grown in each pot.

The question resolves itself into two heads:—1. Will experiments on a large scale confirm the pot experiments made by Mr. Symmonds? 2. Can nitric acid be produced at such a cheap rate as will allow of the neutralization of the alkaline-water in quantities such as to be available for irrigation on a large scale?

To the first question, Professor Perkins has already given a somewhat dubious reply. He says:—

Mr. Symmonds' experiments are of undoubted interest, albeit for the present barely trenching on the difficulties of actual practice. His proposal presupposes an unlimited supply of cheap nitric acid, and the means of mixing it effectively and economically with the enormous mass of water issuing from artesian-bores. Further, he evidently assumes that the nitrate of soda conveyed by the irrigation-waters will tend to counteract the action of the soil alkali; unless, indeed, he proposes to irrigate with waters acidified by an excess of nitric acid, which, again, would tend to increase the amount of nitric acid used.



Let us see what this would mean in the case of the Hergott Springs bore. In order to secure the neutralization of the water, it would be necessary to add nitric acid proportionate to the carbonates present. The analysis shows the water of this bore to contain 42.36 grains of carbonic acid (CO_2) to the gallon; this would represent 2.24 grains of nitric acid (HNO_3) to the gallon of water used in irrigation. Now, in the very moderate computation that one million gallons of water were used to the acre in the course of the year, this would represent 1 ton 8 cwt. 42 lb. of nitric acid, or 1 ton 18 cwt. 33 lb. of nitrate of soda to the acre. We must not forget that this would merely make the water neutral, and that more acid would be required to act upon the alkali already present in the soil. On these figures the neutralization of bore-waters by nitric acid would hardly appear a likely practical operation.

Nevertheless, Mr. Symmonds appears to have secured undeniable results in pot cultures. It should be observed that pot cultures, whilst of inestimable value in many instances, hardly in this special case reproduce the facts of actual practice. We know that the danger from salt or alkali lies in its tendency to concentrate near the surface under the action of the intense soil

evaporation of arid regions. In pot-culture no such evaporation takes place; there is no concentration of alkali. Indeed, portion of the soluble salts must be washed out in the drainage waters. And I must infer that what success may be secured in pot-culture will not necessarily be repeated in the arid desert of the artesian bores.

As to the second question—the possibility of making cheap nitric acid—Mr. Symmonds gives some further information in *The Agricultural Gazette of New South Wales* for August. He says:—

The mechanical power derivable from the pressure given in the outflow from artesian wells (some of them give a pressure so high as 150 lb. per square inch) could probably be turned to account in producing, on the spot, electro-chemical nitric acid from the atmosphere, a process which is now being carried out in Europe at a cost of £8 3s. 6d. per ton. This process for converting atmospheric nitrogen into nitric acid offers some novel features which render it particularly applicable to our unique conditions, the high pressure bores providing the power to produce from the atmosphere an antidote for their own toxicity, and thereby enormously increasing the fertility of the soil, and rendering us independent of a precarious rainfall.

The workers of one process state that they obtained a maximum output of 440 kilos (970 lb.) nitric acid per kilowatt year, when using a current of 0.05 ampère of 6,000 to 10,000 periods per second, at 50,000 volts, each are absorbing 2.5 kilowatts. So that 2.5 kilowatts (about 3.4 h.p.) produced 1.1 ton of nitric acid per year.

A plant such as that mentioned could be duplicated according to the power available. There would not be any expensive transport, or packing of the acid, and it would be quite unnecessary to concentrate it for our purpose, which would mean a considerable reduction in the cost of the plant and working expenses. As the cost of raw material and power is nothing—an occurrence unique in the industrial world—it is simply a question of plant, working expenses, and intelligent supervision, and the enormous advantage of this process is apparent when working on such a large area.

Mr. Gibbons Cox, C.E., advocates the use of the Pelton wheel for utilizing the water-power of artesian bores. He says:—

Where power is to be derived from the higher pressure of artesian bores, or an extremely high fall, the use of the ordinary impulse and reaction turbine is rendered impossible—the one because of the enormous stresses which would be set up in the machinery; the other because of the prohibitively high speed which would be developed. With such bore pressure, or falls, an engine of the simplest construction is desirable, and one in which a reasonably high speed is obtained without undue strain on the working parts. Such a form of engine is found in what is known as the Pelton wheel, if this be intelligently designed. The engine consists essentially of a stout wheel, upon the periphery of which a number of specially shaped buckets, or vanes, are secured. The wheel is rotated by the impulse of the rapidly moving jets, working tangentially against the lowermost vanes, and the power developed is conveyed through the shaft. The power is regulated by a sliding valve, or sluice, behind the nozzle. The action of the vane, or bucket, on the wheel is to divide the jet into two equal parts, each of which glides over the curved surface of the vane, and is deflected backward until it is discharged from the wheel with practically no velocity.

In falling water, the water in a state of pressure from gravity, is led through nozzles into the vanes of the wheel. In artesian flows, the water is likewise led through nozzles into the vanes—also in a state of pressure due to gravity of the body of water held in the water-bearing rocks lying above the level of the bore site; so that, in practical effect, there is no difference between the two sources of supply, the final application being in both cases the same.

This form of water-motor is specially adapted to utilize the pressure power from artesian bores, because the power can be applied *direct from the bore itself*, whereas falling water has in most cases to be led from its head source to the wheel, *a considerable loss of power accruing from frictional resistance inside the piping.*

Taking New South Wales and Queensland combined, there are, as stated, 897 bores now running in these two States. Twenty-eight of them—officially measured—give an average pressure of 82 lb. per square inch (equal to

190-feet head), at which rate the bores now running would give, in pressure applied to a 3 feet Pelton wheel, 39,468 horse-power. That power is now mostly unused, unheeded, running to waste, but it appeals, as does the artesian water itself, with Nature's mute eloquence, for perfect utilization.

The power derivable from artesian flows in Australia is both ubiquitous and unique. It is cropping up in out-of-the-way places where steam power is not payable, and ordinary falling-water power is out of the question. The power is direct and one of the most economical conceivable. To meet the numberless mechanical operations of the station or farm, and for electric lighting—a small dynamo and wheel combined being procurable—it is most desirable. The power being free from working expenses in its production, and the cost being extremely moderate, should ensure its extensive use in the future



Allusion is also made to the possibility of using blast-furnace gases as a means of producing electric energy cheaply, as suggested by Mr. F. Howles, M.Sc., in a paper read before the Society of Chemical Industry.

The importance of the subject is evident when we remember that the main artesian basin of Australia comprises 364 million acres in Queensland, South Australia, and New South Wales. Our artesian area is estimated at 110,000 square miles, or 70,400,000 acres. Its western boundary coincides roughly with the overland telegraph line, from Hergott northwards; its southern boundary is from Hergott eastwards to near Lake Calabonna; thence it passes to the New South Wales frontier south of Lake Boolka. Some of the most im-

portant bores are:—Strangway Springs, depth 365 ft., flow 1,250,000 gallons per day; Coward, 308 ft., 1,250,000 gallons; Kopperamanna, 3,000 ft., 800,000 gallons; Lake Crossing, 1,360 ft., 600,000 gallons; Oodnadatta, 1,571 ft., 270,000 gallons.

There is also a smaller coastal area of artesian waters in Western Australia, stretching from North-West Cape to King George Sound.

It is very satisfactory to know that experiments for the purpose of answering both the above questions are about to be undertaken in New South Wales. In a note subjoined to Mr. Symmonds' article it is stated by Mr. H. C. L. Anderson, Under-Secretary for Agriculture:—

The Minister, being deeply impressed with the potentialities of experimental work on the lines herein indicated, has approved of a start being made at once on soil at the Moree Experiment Farm, which has been irrigated for a number of years with artesian water, of which an analysis is given in this paper.

An area of 2 to 3 acres is being sown with one variety of wheat, one part is to be left untreated, and others treated with nitric acid at the rate of varying quantities per acre.

If the results of the experiment, which will be carried on for several years, after still further irrigation with this artesian water, corroborate the pot experiments herein described by Mr. Symmonds, a distinct addition to our knowledge of this important subject will have been made.

The next step must be to experiment in the direction of making cheap nitric acid, for the present price in Sydney (£32 per ton), with the cost of transport to our artesian bores added, makes the use of it on large areas practically impossible. If, however, the power generated by the ascending column of artesian water in an average bore can be harnessed and used to develop electric currents, which will oxidize the inert nitrogen of the air into nitric acid, the use of this agent to neutralize the toxic effects of the carbonate of soda, and make it into a valuable fertilizer, will be brought within the realm of practical agriculture.

For this second stage of the experiment it will be necessary to get from Great Britain the machinery needed to generate the nitric acid by the operation of a Pelton wheel driven by the force of the artesian bore, and Parliament will be asked to make the requisite appropriation. Meanwhile the other problem of making cheap acid by the agency of the blast-furnace gases now going to waste at Lithgow and elsewhere is one well worthy of the investigation of our engineers.

On June 30 the Premier of New South Wales (Mr. Wade) wrote as follows to the Acting-Premier of South Australia:—"It is an undoubted fact that the flow from many of the artesian-bores is a diminishing quantity, a circumstance which may, however, be due to other causes than the lessening of the main supply. The matter has already aroused a great deal of interest in scientific circles, and numerous theories have been advanced as to the cause of the failing supply. It is, therefore, a question which cannot be answered by reference to any single geological authority, nor perhaps by any combination of official experts. Still, I venture to state that the importance of the issue would justify the experiment, and to suggest to you that a Consultative Board should be formed by representatives of the respective States, who would take into consideration the question of whether the artesian-water supply of Australia is in danger of being seriously diminished, and, if necessary, to advise as to the best means of combating that contingency." The Government of South Australia has agreed to the suggestion for the formation of such a Board.

Insect Pests and Their Foes.

Fourth Progress Report by MR. W. W. FROGGATT, F.L.S., Entomologist
to the New South Wales Department of Agriculture.

(Continued from page 40 of the August issue.)

On arrival in London I presented my credentials to the Chief of the Entomological Staff, who took me round and introduced me to all the officers of the Zoological Department, and placed all their immense collections of material at my disposal. Here I spent all the spare time at my disposal going through the *Diptera* with Mr. Austen, to see all their species of fruit-flies; and though the Economic Branch was discontinued last year, I obtained a great deal of valuable information from the officers and the examination of the collections in their charge. I visited the Zoological Museum at Cambridge University, where Dr. David Sharp is in charge, and spent a day going through their collections, which contain many Australian specimens, and noted the methods they adopt in the mounting and preservation of their museum specimens. Later on I visited Oxford University. Here are deposited the very extensive Hope and Westwood collections, containing the types of many Australian insects of economic importance, among them a collection of scale insects, probably the first made of these obscure and then little-known insect pests. The collection of *Diptera* contained many specimens of fruit-flies, some of great interest; also several specimens of Mediterranean fruit-flies, captured in London and noted in Westwood's handwriting in 1840. At the invitation of Mr. G. H. Verrall, of Sussex Lodge, Newmarket, who has the Bigot and Meigen collections of *Diptera* in his great collection, I spent two days at his place examining these collections, where also there are many Australian types, and established the habitat of a number of *Dacus* and other fruit-flies in Cairo, India, Africa, and the Malay Islands, and found specimens of *Ceratitis catoirei*, closely allied to *C. capitata*, but recorded only from Mauritius and the Island of Bourbon, which I think is a distinct species. At the invitation of the Hon. C. N. Rothschild (who is the greatest authority on that important group of insects, the fleas), I spent a very interesting day with the Director (Dr. Jordan) at the Tring Museum, at Tring Park, one of the finest private collections—if not the finest collection—of natural history specimens in the world. As you are aware, the bubonic plague, and it is suspected leprosy even, has been spread to man by fleas, so that much attention has been paid the last few years to these insects.

I visited the Tropical School of Medicine, attached to the Liverpool University, where Mr. Robert Newstead, the leading economic authority in England, has charge of the entomological work, where specimens of all the insects and their parasites which have been found or are suspected of spreading tropical diseases, such as malaria, yellow fever, and "sleeping-sickness," are collected and preserved. At the present time this Tropical School of Medicine, which has made such wonderful discoveries in the advancement of medical entomology, has three expeditions in the field, two in Egypt and Central Africa, and the third in Brazil. This institution is well supported by the merchants of Liverpool, and at the present time they are subscribing funds to establish a Professorship of Entomology in connection with the University. The damage to trade in Central Africa caused by "sleeping-sickness" can hardly be estimated: the presence of the blood-sucking fly (*Glossina nobilis*)—closely related to the much better-known tsetse-fly of more Southern Africa—has altered the whole trade relations of a vast territory, and is spreading every year. This fly by biting man introduces an organism known as *Trypanosoma* into the blood and causes the death of infected persons. Just after I left London an International Sleeping-sickness Conference was held in London, where scientific men from Germany, Belgium, France, and England met, and I may be allowed to insert the following note from an African newspaper of last month, in which, speaking of sleeping-sickness, the writer says:—

"It is hardly seven years since the terrible and at present incurable malady known as Trypanosomiasis or sleeping-sickness first made its way into Uganda from the Congo basin. In a few months it spread with terrible rapidity, and within a year of its appearance over 20,000 people died in the single district of Usoya. Since then the population of the districts on the lake shore and of the islands has been practically wiped out. Brayoma Island a few years ago counted a population of over 30,000. Two-thirds of that number have already died, and as the rest are all believed to be infected it is only a matter of a year or two before the complete extinction of the sturdy race of islanders who defeated Stanley and Metesa of Uganda, and were with difficulty subdued by Sir F. Lugard. In all some 200,000 out of 300,000 are estimated to have died already in the infected area."

The only Agricultural College in England with a scientific staff doing original investigation is Wye Agricultural College, in Kent. Here I met Mr. F. V. Theobald, the Vice-Principal, who has charge of the economic work, and went all over the laboratories and through the orchards and experimental farms with him. One of the most important diseases at present under observation by the Pathologist (Mr. Salmon) is "wart disease" or "black scab of potatoes" (*Chrysophlyctis*

endobiotica, Schb.). Introduced into England about 1895 it has spread over nine counties of England and Scotland, and, Mr. Salmon says, could be very easily introduced into Australia with seed potatoes. I would suggest that it be proclaimed a disease under our Vegetation Diseases Act, and that a close watch be kept on seed potatoes coming from England. Another fungus disease that has caused so much anxiety among fruit-growers in Great Britain, and which the Board of Agriculture has had a Vegetation Diseases Act passed a few months ago to deal with, is American Gooseberry Mildew (*Sphaerotheca morsuvæ*), and proclamations have been distributed and stuck up all over the country districts warning growers to look out for this pest on their gooseberries. Mr. Theobald informed me that in the pear orchards of England probably the worst pest is "bud gnat," a small fly (*Diplosis* sp.), which lays its eggs on the opening flowers, in which the maggot feeds, causing them to swell out, and then drop off. There is also a small mite that damages the young gooseberries in a similar manner.

Blight-proof stocks are unknown among the apple-growers in England. Most of their apples are grafted on the Paradise stock, which is very much subject to "American blight"; codling moth is very common, but most of the wormy apples are made into cider, and very little trouble is taken with them. Canker in the bark is very common, and attacks every bit of injured bark, often killing the trees.

Having been four weeks in England, and gone through most of the important economic collections, I left for France on March 10, and reached Paris the same evening. I engaged an interpreter, and next morning called upon Professor Marchell, at the Department of Agriculture, and with him spent three days—first going through his collections and noting his methods of work, and then in various institutions. At the Jardin des Plantes I found the Natural History Museum very beautifully arranged for the public, the nests of insects being particularly fine, and went through the cabinets of *Diptera* and other specimens. Professor Marchell informed me that the Meriterranean fruit-fly has on several occasions been taken in the orchards near Paris, but it has never become established, and has probably been brought in the larval state with imported fruit. The olive-fly (*Dacus oleæ*) is common in several districts in the south of France, but has never become a serious pest, and they have no vegetation diseases law to deal with anything but Phylloxera. I met the Professor at the Pasteur Institute, which has charge of the specimens dealing with the tropical diseases, and attended a meeting of the doctors on "sleeping-sickness," upon which they are carrying out many investigations. I was also fortunate in attending the monthly meeting of the members of the Entomological Society of France, and there spoke on our work in Australia. At Professor Blanchard's

laboratories I met Dr. E. Brumf, who has worked on biology in Central Africa, and is now investigating the fowl ticks and their methods of transmitting diseases. At the College of France I met Dr. Félix Henneguy, who has done a great deal of fine work on the morphology of insects. With Professor Marchell I went through the Experimental Gardens at the Luxembourg, and also to Professor Griffon's laboratories and experimental grounds, he being Vegetable Pathologist to the Department of Agriculture, and Director of the Grenoble Station.

On March 13 I left for Madrid, and reached there the following day. I went first to the Museum of Natural Sciences, where I examined the collections, and met Dr. Bolivar, the Director, who said they had plenty of specimens of the olive-fly, but none of the Mediterranean fruit-fly, though it was at times a pest in the south of Spain. I visited the Agricultural Experiment Station and College, where the Director, Professor Navarro, gave me a great deal of information about the insect pests in Spain, and advised me to go to Valencia to see the orange orchards. I enquired about Mr. Compere's statement that has been so widely circulated through the newspapers that there was no codling moth pest in Spain on account of the parasite he discovered there destroying them. Professor Navarro said that from his own observation he knew there was hardly an apple grown in Spain that was not damaged by the codling moth, but as there was no export trade in apples, and the whole of the crop was usually turned into cider, the growers took no notice of wormy apples: they all went under the press. Next day I called upon the Minister and Director of Agriculture, and the latter so strongly advised me to visit the Valencia district that I arranged to take my interpreter and visit the place, where the Department also has a large Experiment Station. From Madrid I left the following night for Valencia via Barcelona, arriving there early next morning.

The whole of the land between the sea and the mountains south of Barcelona is well cultivated, the poorer land growing olives, which can grow apparently without any soil so long as they can get their roots into the limestone. Where nothing else will grow the olive-tree finds a living. At Tarragona there is a large alluvial plain, well irrigated, where a great number of different kinds of fruit-trees and vines is grown; then more poor country growing olives. At Castellon the orchards are all oranges between the sea and the mountains right down to Valencia, and the whole of the land is under irrigation. The crop was being gathered, and great piles of low-grade fruit were scattered about the orchards and lying about the railway stations, where they were packing. Dr. Marti (Director of the Station) says that fruit-fly is practically unknown in the Valencia orchards, but further south, at Malaga, in the months

of September and November, *Haltaphora capitata* often does a great deal of damage, but no methods are adopted to deal with it, though there is at present a Bill before the House of Parliament to give the Department of Fomento power to destroy all infested fruit in the orchards. Outside Valencia great quantities of vegetables are grown, particularly potatoes, all in small fields under irrigation from the mountain streams.

From Valencia I went straight through to Montpellier (France) to the celebrated Viticultural and Horticultural School, and though the Director was away in Paris, through the kindness of the Secretary I went over the entomological division under Professor Marjet, and through the experimental grounds.

"JOURNAL OF AGRICULTURE."

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The Editor, Journal of Agriculture,
North Terrace, Adelaide.

Variations in Types of Lucerne.

By W. L. SUMMERS.

No one familiar with the lucerne-plant can have failed to notice the marked differences not only in general appearance, but in shape and size of leaf of individual plants. Some plants are much more compact, more densely foliated, than others, and a careful examination of a lucerne-field suggests the possibility of increasing the yields obtained from lucerne by a system of selection of the best plants for seed production. This may at first glance appear to be an impracticable task—to be, as it were, playing with the matter; but it must not be forgotten that all improved strains of plants originate by cross-breeding or selection from individual plants possessing the desired characteristics. An ounce or even less of seed from the selected lucerne-plants can be multiplied indefinitely, and provided the progeny retain the characteristics of the parents, would undoubtedly be worth the trouble involved.

The Kansas State Agricultural Experiment Station is giving special attention to this question of the improvement of lucerne, and in view of the fact that lucerne is a leading feature in the agricultural prosperity of that State, the work in which the Experiment Station is engaged is of the utmost importance.

In a bulletin recently issued under the title “Alfalfa-breeding—Materials and Methods,” the operations are fully described. In addition to the selection of seed-plants naturally possessed of the most desirable characteristics, artificial cross-fertilization is being resorted to on a large scale to fix these characteristics. Describing the plants resulting from a small quantity of seed of Turkestan lucerne, and also of first-grade alfalfa, which differed in no way from the standard lucerne-seed, the bulletin says:—“From the outset as the seedlings gained in size, the most marked and striking differences manifested themselves amongst the individual plants of the different plots in respect to habit of growth, form, size, and colour-shade of the leaves, density of foliage, size and succulence of stem, and later in the colour of the flowers. . . .”

In order to ascertain whether it would be possible to build up individual plants into pure races, something like 190 different plants were selected and marked for study. While these plants could be divided into about a dozen types in respect to their general habits of growth and colour, the individual variations were endless. Apart from the very important matter of total yield, the differences in the percentage of leaves to stems were very marked. Again, the size and colour of the leaves varied very materially. An indication of the extent to which these differences exist is given in the following figures:—

Sample No. 29.

Average number of leaves per stem	...	...	34
Percentage weight of leaves to total green			
weight of plant	...	...	67

Sample No. 91.

Average number of leaves per stem ...	...	28·9
Percentage weight of leaves to total green		
weight of plant ...	...	63·3

Sample No. 61.

Average number of leaves per stem ...	...	40·8
Percentage weight of leaves to total green		
weight of plant ...	...	49

Sample No. 89.

Average number of leaves per stem ...	...	37·8
Percentage weight of leaves to total green		
weight of plant ...	...	33·8

These are the extremes in respect to these two points. It will be seen that although Nos. 61 and 89 produced a greater number of leaves on the average stem, the percentage weight of leaves was much lower than in Nos. 29 and 91. The inference is that the leaves in the latter, though not so numerous, were larger and more succulent than in the former—a very important matter in the feeding-value of the crop.

During the course of these experiments in 1907, a severe freeze was experienced, resulting in the lucerne-field being badly injured; so much so that as a general rule farmers in the affected region lost their first cutting for the season, being compelled to mow the injured plants in order to stimulate vigorous growth. A careful examination of the experimental plots disclosed the fact that while the Turkestan lucerne remained, as a whole, green, some of the plants were killed right to the ground. Occasionally of two plants side by side one would be uninjured and the other severely frosted. With the ordinary lucerne the great majority of the plants was badly injured, but there were occasional plants unaffected, or at the most affected at the tips of the shoots only. As with the Turkestan lucerne, instances occurred where plants badly affected stood side by side with uninjured plants, suggesting that the absence of injury was due to some inherent characteristic of the plant and not to accident of situation, etc. Recognizing the importance of securing a type of lucerne resistant to frost, special attention is being given by the Experiment Station to these plants. In view of the success achieved in various parts of the world in the development of races of plants more resistant to cold, diseases, etc., than others of the same species, there appears to be good reason to anticipate a fair measure of success in this work.

As showing the greater power of resistance to frost possessed by the Turkestan lucerne, as compared with the ordinary lucerne, of over 700 plants of each variety which were examined, 39·3 per cent. of the Turkestan and 6·3 per cent. of ordinary lucerne escaped injury; while 2·2 per cent. of the former and 39·5 per cent. of the latter were seriously injured.

The Wheat Commission.

Summary of the Evidence.

The members of the Wheat Commission—Messrs. E. H. Coombe, M.P. (Chairman), Hon. R. Butler, and Messrs. C. Goode, A. McDonald, J. Newland, and C. Vaughan, M's.P.—returned to Adelaide on July 18 from Sydney, and on the 27th held a meeting at Parliament House, Adelaide, at which no evidence was taken.

On August 3, Mr. A. LeMessurier was examined respecting the cost of shipping wheat from almost every outport in South Australia to Port Adelaide. The official of the wheat merchants' "honourable understanding" had previously supplied a list, showing differences between the prices at Port Adelaide and all the buying centres of the State. The examination of the witness was in the direction of showing what proportion of the margin was accounted for by freight, wharfage, and shunting-charges.

On August 10 Mr. John Darling, who had previously given evidence for three days, was recalled, and examined chiefly as to why the reduction in freights in October last was not passed on to the producers. In a letter which had been previously supplied to the Commission by the Railways Commissioner, it was stated that the reduction in freight had meant, between October 14, 1907, and June 30, 1908, a loss to the revenue on wheat alone of £11,000. Mr. Darling disputed these figures, and said that as far as the members of the "honourable understanding" were concerned, they had only benefited by the freight reduction to the extent of £2,071. They had not passed this amount on to the farmers, because the reductions which the Government had made in December, 1907, with respect to demurrage and working-hours at railway stations had involved them in an expenditure of £2,500. They had still to make up that £500. Mr. Darling was examined in detail respecting the prices paid at different towns and apparent discrepancies between the prices at towns situated at the same distance from a port.

The Railways Commissioner (Mr. A. G. Pendleton) attended on August 17, and explained that when furnishing his estimate of £11,000 as the amount lost in freight on wheat, consequent on the reduction in rates in October, he had been supplied with the amount lost on grain generally and not only on wheat. His amended estimate was that £4,500 had been lost to the revenue on wheat alone because of the reduction, and it would have been more had the quantity of wheat carried not been considerably less than it was the previous year. He said he had

no means of checking the amount lost to the merchants as a result of the demurrage and working-hours regulations; but he doubted very much whether it was £2,500, as stated by Mr. Darling.

On August 24 the Commission examined Mr. J. T. Mason, vigilance officer of the Port Adelaide Workingmen's Association, who supplied detailed information as to the charges of lumpers and waterside-workers, and said he did not believe the extra amount paid by the merchants in consequence of overtime since the railway by-laws came into force in December last amounted to £300 at Port Adelaide. At other ports no extra charge for overtime could have been incurred, because the rates at Port Pirie and Wallaroo had not been altered respecting the working of overtime, as they were at Port Adelaide in December last.

Mr. C. H. T. Connor, manager of the Adelaide Milling Company, was examined on August 24 respecting the motive and method of working of the "honourable understanding." His evidence closely corresponded with that previously given to the Commission by Messrs. Johnston, Darling, and Cave.

Produce Export Notes.

Extracts from the Commercial Agent's Report, July 17.

STRAWBERRIES AND CHERRIES.

The season for strawberries and cherries has been a record one; the finest strawberries for preserving have been obtainable at as low a price as 2d. per lb.; whilst a 3-lb. jar of strawberry jam can be purchased for 10½d. retail.

PRESERVED FRUIT.

I have been making enquiries as to the prices likely to be obtained at the present time for preserved apricots and peaches, and the latest quotation for Californian fruit is as follows:—

Apricots.—Extra standards, 5s. 6d.; first standards, 4s. 7½d.; second standards, 4s. 1½d.

Peaches.—Extra standards, 7s.; first standards, 6s. 6d.; second standards, 5s. 9d.

Terms in both cases are c.i.f. Liverpool or London.

Bordeaux Mixture and other Fungicides.

By GEO. QUINN, Horticultural Instructor.

Bordeaux Mixture is recognized the world over as the best dressing for preventing the attacks of the various fungus diseases which are found attacking orchard and garden plants.

In the many formulæ which have been tried the quantities of lime and bluestone and the methods of combining them vary considerably. The formula which has gained general acceptance in Australia is composed of

6 lb. bluestone (copper sulphate)
4 lb. quicklime (calcium oxide)
50 gallons of water

and when used in districts subject to spring showers, the addition of either sugar, molasses, or common salt equal in quantity to the lime has proved satisfactory.

The method of making bordeaux mixture is as follows:—In a wooden vessel (a barrel is best) suspend the bluestone in a piece of hessian or bran bag some hours before it is required, allowing the water in the barrel to merely cover it as it hangs. This solution will keep for a considerable time, so it may be made whenever convenient. The lime should be placed in another vessel (a wooden tub or barrel for preference) and small volumes of water poured over it from time to time until it crumbles to powder. It may then be covered up with water to a fair depth and receive an occasional stirring. This usually occupies an hour or thereabouts. This lime-compound will keep pretty well if covered fairly airtight, but it is best utilized on the same day when made, as the mixture made from long-slaked lime tends to lose in adhesiveness.

When ready to start spraying, the bluestone solution should be diluted to its full extent, i.e., in making 50 gallons dilute the bluestone to 25 gallons. After stirring up the contents of the lime-water tub, strain out the milky liquid through a finely meshed sieve (or piece of bran-bag) and dilute it also to its full quantity, i.e., 25 gallons. Into a third vessel—which may be the spray-pump tank—run at the same time the solution of bluestone and the milk-of-lime liquid, stirring them constantly as they come together.

Where a fair amount of spraying is to be done, a simple but effective outfit for the manufacture of this mixture consists of two wooden tubs—each of a capacity of 25 to 30 gallons—which are elevated on a small platform to a height of about 4 feet. In front of these, on the ground and midway between them, stands another barrel or tub of a

capacity of 50 to 60 gallons. A short siphon tube in each upper tub may be used to draw the contents into the lower and larger vessel, or a bung-hole, fitted with a wooden tap or plug in the front face about an inch from the bottom of each of the upper tubs, may be used for the same purpose. The advantage claimed for the blending of diluted instead of strong or dense liquids containing bluestone and lime respectively is that the resulting compound consists of a light precipitate which remains in suspension throughout the body of the water much longer, thus ensuring a more even distribution of the essential properties of the fungicide. The importance of this is obvious where consistent results are imperative.

The ingredients used must be pure, the bluestone being free from iron sulphate, and the lime must be perfectly fresh, i.e., not airslaked. To overcome the last-named difficulty it should be procured, carried home, and kept in an airtight vessel until used. With regard to the composition of the water there does not seem to be any objection to the use of ordinary spring or well supplies, although, wherever possible, it is always safer to make this wash with rain-water.

When the bordeaux mixture has been prepared, it should contain no free copper sulphate, or injury may result to foliage, flowers, or fruits. The presence or absence of this free copper may be roughly tested by inserting a polished steel knifeblade for a few seconds into the liquid. If present, the copper coats the steel, making it as bright and copper-looking as a new penny piece. A more accurate test is to drop into the spray-wash a few drops of potassium ferrocyanide solution, and if free copper sulphate be present, even in most minute quantities, the reddish-brown discolouration is instantly seen around the spot where the drops of this liquid entered the wash. If the knife becomes copper-coated, or the potassium ferrocyanide creates a reddish-brown tint, more limewater or milk of lime must be added until such reactions fail to show.

A NEW BORDEAUX MIXTURE.

At the Woburn (England) Experiment Fruit Farm investigations have shown that the clear lime-water—made by slaking 3 lb. of quicklime in about 100 gallons of water and then adding 86 gallons of this clear solution to 14 gallons of water, in which 6 lb. 6½ oz. of copper sulphate have been dissolved—will yield 100 gallons of bordeaux mixture superior to and cheaper than that made according to the commonly accepted formula. As our ordinary commercial forms of quicklime vary exceedingly in its essential constituent, viz., calcium oxide, the potassium ferrocyanide test becomes essential if anyone is disposed to give this latter formula a trial.

The scientific reasons advanced for its acceptance seem truly convinc-

ing, and quite apart from the question of economy its trial is cordially recommended to our orchardists. This would certainly eliminate the fine, sandy grit which now plays havoc with our cyclone nozzle jets. It may be mentioned that a few ounces of the dry crystals of potassium ferrocyanide can be purchased cheaply at any wholesale chemist's store in Adelaide.

THE BURGUNDY (COPPER-SODA) MIXTURE.

This mixture, which is of comparatively recent introduction, consists of a compound of bluestone (copper sulphate) and washing-soda (sodium carbonate) in the proportions of 6 lb. bluestone and 9 lb. washing-soda to 50 to 60 gallons of water. It is made up in the same manner as the bordeaux mixture. It possesses the following advantages—(a) easy running through the nozzles; (b) the constituents may be procured at any time without fear of deterioration from keeping.

Mr. McAlpine, the Government Vegetable Pathologist of Victoria, has used this compound against black-spot (*Fusicladium*) of the apple with very gratifying results, and the writer has applied it to peach-trees, securing equally complete immunity from the curl-leaf fungus (*Exoascus deformans*) as where ordinary bordeaux mixture has been used. Whilst confidently recommending it for trial by those situated in districts where fresh lime is difficult to procure, I wish to suggest caution respecting its use upon flowers or young foliage. Further trial is necessary to demonstrate whether it is comparatively innocuous or otherwise, to these parts of the tree, but the writer used it with safety when the colour of the peach-blossoms was clearly seen in the opening buds.

THE APPLICATION.

These mixtures should not be compounded more than a few hours before being sprayed upon the trees. For reasons that have not yet been very clearly explained, uneven results follow upon the use of stale bordeaux mixture.

It should be borne in mind that all of these washes act as preventives and not as cures; hence the necessity for applying them at the proper time. In most instances the best indications of the arrival of this period is offered by the fruit-trees to be treated. The fungi to be suppressed are vegetables whose vegetative activities are started into operation by the same stimulating influences, viz., warmth and moisture, which cause their host-plants to send out buds and leaves. Experimental tests have shown conclusively that the best time to begin to apply bordeaux mixture for the suppression of the curl-leaf fungus of the peach and nectarine, the scab and shothole of the apricot, and the black-spot of the apple and pear, is just when the flowers are opening, i.e., when the flower-buds are showing the colour of the reverse of the petals.

Well-made bordeaux mixture does not injure the blossoms even if they be expanded. This is the only application effective against the curl-leaf fungus, but in damp districts another spraying, after the fruits have set, is desirable for the suppression of the fungi mentioned as attacking the apricot, apple, and pear. The gumming-disease of the peach and apricot has, according to American investigators, yielded to the application of bordeaux mixture when given at the time of the fall of the leaves only.

It should be borne in mind that the spores and vegetative organs of the fungi which attack our fruit-trees are extremely minute and may be lodging in every available crevice and bud. When they start to germinate, the first growth is very tender and susceptible to injury from corrosive chemicals or desiccating sun-heat. It is only when such spores germinate in direct contact on the tender portions of the host-plant that a successful infection takes place. Were it not for this, their extreme abundance would render the cultivation of some plants impossible. The fruit-grower should remember that it is not so much upon the great strength of the fungicide he is using, as upon its being applied at the right time and in a thorough manner, that the successful repression of these fungi depends.

Bordeaux mixture should be applied by means of a force-pump which is fitted with an automatic agitator which will secure constant and even mixing and distribution throughout the liquid of the copper precipitate which is the real fungicide. An agitator which fulfils a rotary or semi-rotary motion with each stroke of the pump-handle or piston performs this best. The spray should be distributed through fine mist-producing nozzles, those giving a swirling, cyclonic discharge proving most suitable. The nozzle used should be readily adjustable, so that the jets or outlet-holes may be quickly freed from grit or obstructions.

Owing to the widely distributed nature of the spores, the whole of the tree under treatment should be wetted, i.e., completely coated with the fungicide, from the tip of the topmost twig downwards to the groundline, making sure that every crack, bud, and crevice in the bark receives its quota of the spray. Bordeaux mixture may be mixed with paris green, arsenate of lead, or Kedzie's arsenite of soda-lime compound, and thus combine a fungicide with a preventive of the attacks of leaf- or fruit-eating insects, such as caterpillars or beetles. In the case of either paris green or Kedzie's arsenite being used in this manner, it should, prior to blending with the bordeaux, be rendered insoluble in water by being mixed with freshly-made, strong lime-water in the usual manner.

A Native Bird Destroying the Sparrow.

By C. T. MUSSON, Hawksbury Agricultural College; recorded in *The Agricultural Gazette of New South Wales* for August.

IN the *Lachlander and Condobolin District Recorder*, February 26, 1908 (sent by Mr. G. L. Sutton, with paragraph marked), the following statement appeared:—

“Mr. A. J. Taylor, of Wheatacre, informs us that during the past few months he has noticed the presence of numbers of large birds, blue in colour, with black heads, which are very destructive to sparrows. In fact since the arrival of these aerial cannibals, sparrows are practically an unknown quantity about Wheatacre.”

We wrote Mr. Taylor for further information, and received the following reply:—“*Re* the bird that takes the sparrows, it is quite true there is not a sparrow left about the place, and there were hundreds here. I tried in every way to get rid of them, but since those birds came we got rid of them. We never saw the birds before; they are strangers. There are about four of them in a flock, and they keep together. I do not think it is a hawk, though they balance in the air like a hawk. They keep after the grasshoppers, but they are dead on the sparrows. The other birds are not frightened of them. They are very quick on the wing, and, when flying, spread out the tail.”

Three days later came a specimen for identification: it is the Ground Cuckoo-Shrike (*Pteropodocys phasianella*). The head and neck are dark-grey; breast and lower back dull white crossed by narrow black bars; wings, upper side black; under side white; tail forked; the terminal half black. It is about the size of a small pigeon, but more slender; total length from tip of bill to end of tail, 14 inches. Commonly, they make use of their legs a good deal, not flying much. Insects are the chief food, and we do not hear of them doing any damage.

This is a most interesting fact, which should be noted by all dwellers west of the range where the bird is found. If this is to become a fixed habit, which probably it now will, it would appear that the sparrow has at least one enemy in its new abode. Sportsmen should take note and act up to the fact stated. Nature would here seem to be coming in, for evidently the cheeky little interloper is no longer to have such a peaceful time as it has had in the past. The “balance is beginning to kick,” and we may congratulate ourselves that at least one cause is in operation which will help in bringing the sparrow down in numbers to such reasonable limits as will preserve a due balance of life forms, and not allow this particular bird to become unduly plentiful.

Broinowski, in his “Birds of Australia,” says:—“This bird is found in most parts of the interior of Australia, frequenting principally plains and thinly-timbered forest country. It is always seen on the ground, in small flocks, from two to eight in number.”

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, August 12, there being present:—Messrs. G. R. Laffer (Chairman), A. Molineux, J. W. Sandford, C. J. Tuckwell, C. J. Valentine, Chas. Willcox, Professor Perkins, A. M. Dawkins, J. Miller, Colonel Rowell, and W. L. Summers (Secretary).

Some further discussion took place on the question of the preparation of plans and specifications of house for the benefit of new settlers, and on the motion of Mr. Willcox it was resolved that the Hon. Minister be asked to give effect to the previous resolution of the Board suggesting that premiums be offered for plans for four types of houses which could be cheaply erected by the settlers themselves.

The Hon. Minister intimated that it was not intended to provide at present for any further trial of stone-gathering machines, as suggested by the judges at the trial held in February last.

Mr. Willcox stated that he had thoroughly discussed with the Secretary the question of legislation needed to prevent the sale of adulterated chaff, and submitted recommendations on the subject. He called attention to the prosecution recently instituted in Victoria, and thought that was ample justification—if any were needed—for the action suggested by the Board. Not only was the adulteration of chaff an injustice to the purchaser and honest trader, but it was a positive cruelty to animals, and in his opinion it was time that some attempt was made by the authorities to check this growing evil. Some discussion ensued on the subject, and on the motion of Mr. Willcox it was resolved that it be a recommendation to the Hon. Minister that the following clauses be embodied in the proposed Sale of Chaff and Fruit Bill:—

DEFINITIONS.—“Hay chaff” shall mean the chaffed stalks, leaves, and heads of wheat, oats, lucerne, and such other plants as may from time to time be proclaimed by the Government. “Straw chaff” shall mean the stalks, leaves, and heads of wheat, oats, and lucerne from which any portion of its natural productions of grain or seed has been removed. “Mixed chaff” shall mean an admixture of “hay chaff” or “straw chaff” in any proportions.

CLAUSE A.—It shall be an offence to sell or offer for sale or expose for sale any “straw chaff” or “mixed chaff” unless the bag or package containing the same shall have printed thereon or affixed thereto a label in legible letters stating whether such contents are “hay chaff,” “straw chaff,” or “mixed chaff.”

CLAUSE B.—Every person selling chaff in a quantity of 10 cwt. or more shall give to the purchaser, on delivery of the chaff, a signed statement indicating whether the chaff is “hay chaff,” “straw chaff,” or “mixed chaff,” and such statement shall have the effect of a warranty of the statement contained therein.

CLAUSE C.—If any person sells or delivers as a food for horses, cattle, or sheep any chaff or article which contains any ingredient in such quantities as to be deleterious to horses, cattle, or sheep, or to which has been added any ingredient worthless for feeding-purposes, and not disclosed at the time of sale, it shall be an offence under this Act.

The Secretary reported that during the month of July eighty-eight reports of Agricultural Bureau meetings were received. Of the total number of 114 on the roll, 105 had met during the preceding three months. The defaulting Branches had been communicated with, and efforts are being made to revive interest in their work. The Kapunda Branch had been closed owing to the apathy displayed by the members.

The following gentlemen were approved as members of the under-mentioned Branches:—Messrs. F. C. Brown and E. H. Scruby, Cummins; W. Schuppan and A. Maslin, Wilmington; D. N. Smart, J. Hodby, S. Cram, S. Wilson, and P. O’Leary, Belalie North; T. Davidson, Clarendon; L. Clark, Hartley; A. E. Fuller, Wepowie; C. L. Palm, Paskeville; W. J. Kessell, Uraidla and Summertown; J. Simon, P. J. Dempsey, C. Fowler, and E. Travers, Yongala Vale; J. R. Redding and T. Giles, Minlaton; R. Day, Mallala; G. W. Ayliffe, Kingscote; A. Guy, Tatiara; A. H. Collins and H. E. Collins, Mount Bryan; A. Phelps, Dowlingville; S. Howe and R. Waters, Angaston; A. R. Scholz, W. Stapledon, and D. Pettit, Kybybolite; A. Fuller, Dawson; W. Jeffrey and T. G. Mead, Lameroo; F. L. M. Grund, A. B. Grund, J. J. Tupley, and M. Learl, Miltalie; A. Olsen, G. W. Murray, and A. Brown, Penong; E. N. Twopenny, Quorn; W. Heaslip, W. Parker, F. Schönnner, and H. Rex, Saddleworth; P. Roediger, Balaklava; S. Smith and H. Wade, Meadows; T. Hawes, Arden Vale; J. Williams, T. Ottoway, T. M. Cowley, and C. Storry, Butler; H. O. Henderson and D. G. Taylor, Meningie; J. Kreig and A. E. Rowe, Brinkworth; F. Bayne, senr., Pine Forest; R. D. Tollner, H. C. Pearce, A. Langeludecke, and E. Duffield, Naracoorte; W. Morgan, J. Rowe, C. E. Borroughs, J. Burton, and J. Modestack, Waikerie; A. Christie and V. Mazzaroll, Lipson; and A. Klein, J. Page, and A. G. Lamshed, Arthurton.

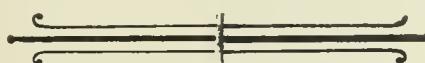
Approval was given to the formation of a Branch of the Agricultural Bureau at Coomooroo, with the following gentlemen as members:—Messrs. J. T. Kildea, H. Ward, J. Brown, J. Phillis, E. Berryman, G.

Stott, E. Hall, J. Toholke, A. Cook, Jer. Brown, J. Polden, A. White, J. Kirkland, J. Brice, and C. Brice.

The Cherry Gardens Branch intimated that the Annual Conference of Southern Branches would be held at Cherry Gardens on October 8. The Secretary reported that the usual arrangements were being made for the Annual Congress of the Agricultural Bureau to be held during Show week. On the suggestion of the Chairman, it was resolved that it be a suggestion to the Hon. Minister that the Hon. the Premier should address the Congress on questions affecting the handling of South Australian produce in Great Britain.

On the motion of Mr. Dawkins it was resolved that the Board respectfully ask the Hon. Minister to obtain a progress report on the research work being carried out by the Veterinary-Surgeon in connection with the disease in cattle known as "dry bible."

Mr. Sandford stated that he had been requested to bring before the Board the matter of the veterinary examination of stallions. In Victoria and Queensland considerable attention had been given to this matter, and he understood that in Victoria, at any rate, the Agricultural Department had decided that all stallions exhibited at Agricultural Shows should be subject to veterinary examination, and that no prizes should be awarded unless the animals were certified to be sound. Those interested here seemed to be of the opinion that unless some similar action was adopted in South Australia the stallions which were refused veterinary certificates in Victoria would be sent to this State, to the detriment of horse-stock here. Colonel Rowell stated that the Agricultural Society had already urged upon the Hon. Minister that subsidies should be withheld from all Societies awarding prizes to stallions which had not been passed by a veterinary-surgeon, and the Hon. Minister had agreed to do this in future. On the motion of Mr. Sandford, it was resolved that the Hon. Minister be asked to introduce a measure whereby it shall be compulsory that all stallions whose services are offered for hire must pass an examination by a veterinary-surgeon appointed for the purpose by the Government, and who shall issue a certificate of soundness to such stallions as are found to be sound.



Poultry Notes.

OVERSEA EXPORT OF EGGS.

All arrangements have been concluded for the season's export of eggs to England. The following will be the order of shipments:—

R.M.S. "Victoria," sailing October 1, about 1500 cases.

R.M.S. "Britannia," sailing October 15, about 1200 cases.

Vessel to be arranged, sailing middle November, about 2500/3000 cases.

The total cost, including receiving, testing, grading, packing, freight, selling in London, and other charges, will amount to $3\frac{1}{2}$ d. per dozen.

Last year's shipments were successful, and the average net price at Port Adelaide of all grades works out at $7\frac{1}{4}$ d. a dozen. The extra or A grade netted $8\frac{1}{2}$ d.; the standard or AA grade, $7\frac{1}{2}$ d.; and the third or AAA grade, 6d. Looking back at the prices ruling during the glut season, for many years in Adelaide, this average price of $7\frac{1}{4}$ d. is eminently satisfactory, and contrasts very strongly with the old-time $5\frac{1}{2}$ d. and 6d.

The Commercial Agent (Major A. E. M. Norton, D.S.O.) advises that he can place large quantities of eggs, of similar quality to those already sent, at satisfactory prices. It must distinctly be borne in mind that the object of this trade is the relief of the local market during seasons of glut and cheap prices, with the ultimate effect, after removing such surplus from the field of local competition, of firming the market during the autumn and winter, to the advantage of the careful poultry-breeder.

Eggs for shipment to England will be received at the depot, Port Adelaide, on or after September 1. Shippers should write to the manager, Adelaide, for circulars, address labels, etc. The advance of 4d. a dozen on fertile eggs and 5d. per dozen on infertiles will be made as last year. Ship infertiles—they are worth more. Consignments of eggs must be addressed to the Manager of the Government Freezing-works, Ocean Steamers' Wharf, Port Adelaide—carriage paid—and the name and address of the consigner and the contents of packages should be stated on the card.

The Wheat Market.

The price of wheat has shown a slight upward tendency during the month, beginning at 3s. 9½d. per bushel at Port Adelaide on August 1, rising to 4s. on August 21, and dropping later to 3s. 10½d. English prices have also advanced slightly, and it is evident that the arrival of the new season's wheat on the world's market has not lowered values; indeed, it seems quite possible, in view of the short stocks on hand at the close of the season and the failure of crops in some countries, that the future movement may be to some extent an upward one.

Writing on July 10 *Beerbohm's Evening Corn Trade List* says:—"The outlook for wheat is getting distinctly more defined and clearer. For a considerable period buyers have acted with extreme caution, and have been awaiting more definite news with regard to the crops, especially those of America and Russia, on which so much depends during the next six months. Both of these crops have proved or are proving disappointing. Last month we suggested that America might reap at least 700 million bushels; to-day there are not many who expect more than 660 millions. Then, in regard to Russia, evidence is accumulating that for the third successive year the crop will be a very moderate one, probably very little better than last year. . . . These conditions in Russia and America are, we suggest, sufficient to justify our remark that the wheat market is now entering upon firmer ground; and when it is remembered that the Indian surplus is this year a mere bagatelle, one may be excused for suggesting that whatever may happen during the next few weeks as a consequence of the advent of the new wheat, the new season is likely to be a 'bullish' one, and not, as at one time seemed likely, a 'bearish' one."

The following table shows the total shipments of wheat and flour to Europe from July 27, 1907, to July 17, 1908, compared with those of the previous year:—

Sources of Supply.	July 27, 1907, to July 17, 1908. qrs.	Same Period, 1906-7. qrs.
U.S.A. and Canada	21,775,000	17,700,000
Argentina and Uruguay... ..	13,975,000	11,707,000
Russian and other Black Sea Ports	7,325,000	11,380,000
Danubian	2,820,000	9,030,000
India	2,356,000	3,472,000
Australasia	1,320,000	2,509,000
Sundries	1,419,000	1,327,000
Totals	50,990,000	57,125,000

Date.	LONDON.		PORT ADELAIDE.		MELBOURNE.		SYDNEY.	
	Previous Day.		(Farmers' lots on trucks).		Per Bushel.		Per Bushel.	
Aug. 5	Quiet; firm; 4/8½ April ...	...	3/9½	...	4/1 and 4/1½	...	4/2	...
6	Unchanged	...	3/9½	...	4/1	...	4/2 nominal	...
7	Dearer; Liverpool 4/9¾ s. Aug.; 4/10½ s. Sept.	...	3/9½	...	4/1½ ex store	...	4/2	...
8	Quiet; Liverpool 4/9¾ s. April	...	3/9½	...	4/1½ to 4/2 ex store	...	4/3 s.	...
10	Quiet	...	3/9½	...				
11	Unchanged; Liverpool 4/9¾ s. afloat; very dull	...	3/9½	...	4/2 ex store	...	4/3 nominal	...
12	Quiet; firm; Liverpool 4/9¾ s. afloat	...	3/10½	...	4/2	...	4/3	...
13	No quotation	...	3/10½	...	4/2 ex store	...	4/2½ to 4/3	...
14	Quiet; firm	...	3/10½	...	4/2½	...	4/2½ b.; 4/3 s.	...
15	Very quiet; Liverpool 4/9 s. sailer; 4/9¾ s. afloat; firm	...	3/10½	...	4/2½ to 4/3	...	4/3½	...
17	Steady; quiet; unchanged	...	3/10½	...				
18	Very quiet; firm; Liverpool 4/9¾ s. afloat	...	3/10½	...	4/3 ex store	...	4/3	...
19	Quiet; easier; Liverpool unchanged	...	3/10½	...	4/2½ to 4/3	...	4/3½ s.	...
20	Steady; unchanged; Liverpool 4/9¾ s. afloat	...	3/10½	...	4/2 to 4/2½	...	4/3 s.	...
21	Firm; rather dearer; Liverpool steady	...	4/-	...	4/2-country lots	...		...
22	Unchanged; Liverpool 4/9¾ s. afloat; very quiet	...	4/-	...	4/2 to 4/2½	...	4/2½ b.; 4/3 s.	...
24	Quiet; firm	...	3/10½ to 4/-	...	4/1	...		...
25	Firm; Liverpool 4/9¾ s. August; dull	...	3/10½ to 4/-	...	4/1 ex store	...	4/1 to 4/1½	...
26	Quiet; lower; Liverpool 4/9¾ afloat; quoted	...	3/10½	...	4/1¼ f.o.b.; 4/1 ex store	...	4/2½ b.; 4/3 s.	...
27	Dull; Liverpool 4/9¾ s. afloat; inactive	...	3/10½	...	4/1 to 4/1½	...	4/2 b.; 4/3 s.	...

FREIGHTS.—South Australia to London (steamer), 15/- per ton (4½d. per bushel); sailer, 21/3 per ton (6½d. per bushel). S.A. to S. Africa, 17/6 per ton (5¾d. per bushel). Adelaide to Sydney, 9/6 per ton (3d. per bushel). Adelaide to Melbourne, 8/- per ton (2½d. per bushel).

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on August 28:—

WEATHER.—Whilst in the early part of the month dry conditions prevailed, accompanied by frosts and cold weather, a welcome change set in on the 20th, and one of the most bountiful rains experienced in this State for many years fell during the following three days. All over South Australia good downpours from 1 in. to 1½ in. have been registered, so that at time of writing the pastoral and agricultural country has greatly benefited, and the outlook for the husbandman appears more promising.

COMMERCE.—A fair average trade is reported in all general lines. The absence of rain early in the month to some extent caused operators to restrict their buying, but the copious fall of last week has somewhat induced larger purchasings, and there is every reason to look for a considerable increase in the turnover as Spring conditions set in.

BREADSTUFFS.—The Wheat market has been extremely dull, and only small operations have been made public. Flour continued quiet with a very moderate export business only. **Fodders.**—A fair turnover was put through in Chaff, and early in August a good deal of exporting business was done, but the tall market now obtaining has put oversea trade out of court, although enquiries continue to come along from New South Wales and Victoria. Mill Offal was in good request, the high prices of dairy produce having stimulated the call in many quarters, so that millers were able to clear their stocks. In Feeding-grains only meagre sales were made.

POTATOES AND ONIONS.—Considerable activity has ruled in both of these lines, and consequently values decidedly advanced. Owing to over-speculation in potatoes, however, business has now become temporarily quiet, but as the local crop promises to be rather later than usual, it seems certain that quotations will not relax for some time to come, and sellers are therefore not inclined to reduce prices. In Onions no appreciable alteration in values is expected at present.

DAIRY PRODUCE.—With an almost unprecedented shortage of supplies in the Eastern States, resulting in exceptionally high values for Butter there, prices in sympathy firmed here. Indeed, the excited markets which ruled at the beginning of the month were a strong feature of the trade, and sharp advances were made from 3d. to 6d. per lb., and firmed to such an extent that almost record prices ruled. Whilst the boom, which was of very short duration, lasted, the demand for butters was strong, but, unfortunately, the local consumption very soon showed a marked decrease, and with supplies of prints rapidly increasing, coupled with quotations in Melbourne and Sydney coming back so quickly, a sharp reaction set in here, prices retiring with equal suddenness as they had advanced. However, good trade is now being done on a normal market, West Australia and Broken Hill operating strongly, whilst fairly heavy orders have been fulfilled in the East. **Eggs.**—Quantities are now approaching the flush of the season, and already picklers have commenced operating for future requirements. **Cheese.**—The forwardings showed a marked increase, but as rates in the East have eased values here are also likely to recede. **Bacon and Hams.**—Fair business in this line, and rates keep steady. **Honey.**—All consignments of Prime Clear Extracted found ready quittance, but dark and discoloured lots slow of sale. **Almonds.**—Short of wants; all lots speedily cleared.

CARCASS MEAT.—There was an improvement in the quantities of both Pork and Veal submitted at Friday's market, and the figures realized for all quality-lots were satisfactory. Veal is in plentiful supply, and prime stuff secured good prices, but poor sorts are hard to place.

DRESSED POULTRY.—Nicely prepared turkeys and fowls were quickly disposed of.

LIVE POULTRY.—Heavy numbers were penned, and as demand was exceptionally keen good rates ruled throughout for all quality-birds.

MARKET QUOTATIONS ON AUGUST 28.

WHEAT.—Shipping parcels f.o.b. Port Adelaide, 4s. to 4s. 1d. per bushel of 60 lb.

FLOUR.—City brands, £9 5s.; country, £9 per ton of 2,000 lb.

BRAN.—1s. 3½d.; POLLARD, 1s. 3½d. per bushel of 20 lb.

OATS.—Local Algerians, 2s. 11d. to 3s.; White Champions, about 3s. per bushel of 40 lb.

BARLEY.—Cape, for feed, 3s. 8d. to 3s. 10d. (nominally) per bushel of 50 lb.

CHAFF.—£6 7s. 6d. to £6 10s. f.o.b. Port Adelaide per ton of 2,240 lb.

POTATOES.—Gambiers, £6 2s. 6d. per ton of 2,240 lb.

ONIONS.—Gambiers, nominally, £10 to £11 per ton of 2,240 lb.

BUTTER.—Factory and choice Creamery, fresh in prints, 10½d. to 11¼d.; best separators, dairies, 9½d. to 10½d.; medium creamery and ordinary dairies, 9d. to 9¼d.; stores and collectors, 8¾d. to 9¼d. per lb.

CHEESE.—Factory makes, new-made to well matured, 8½d. to 10d.

BACON.—Factory-cured sides, 8½d. to 9½d.

HAMS.—9d. per lb.

EGGS.—Loose, 8d. per dozen.

LARD.—Skins, 9½d.; bulk, 9d. per lb.

HONEY.—Prime clear extracted, 2½d.; dark and discoloured, 2d.; beeswax, 1s. 1d. per lb.

ALMONDS.—Softshells (Brandis), 6d.; mixed softshells, 5½d.; kernels, 1s. per lb.

CARCASS MEAT.—Prime shop porkers and good baconers, from 4½d. to 5½d.; heavy choppers and medium-quality sorts, 3d. to 4¼d.; veal, from 3d. to 3½d. for prime; medium sorts, 1d. to 2d. per lb.

DRESSED POULTRY.—Turkeys 7d. to 8d.; fowls, 5½d. to 6½d. per lb.

LIVE POULTRY.—Heavy-weight table roosters, from 2s. 6d. to 3s. each; fair-conditioned cockerels, 1s. 9d. to 2s. 3d.; hens, 1s. 4d. to 1s. 8d.; ducks, 2s. to 2s. 6d.; geese, 3s. to 4s.; pigeons, 6½d.; turkeys, 5½d. to 7¼d. per lb., live weight for fattening to good table sorts.

TO ADVERTISERS.

The "Journal of Agriculture" has a circulation of 5,300 Copies monthly amongst the Cultivators of the Soil in South Australia, and consequently is a valuable medium for advertising Farm and Orchard Supplies and Requisites. Particulars as to charges for space on application to The Editor.

AGRICULTURAL BUREAU REPORTS.

Edited by W. L. SUMMERS.

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* No report received during month of August.

† Only formal business transacted at the last meeting.

NOTE.—Owing to our going to press early this month, a number of reports received after August 27 are held over.

REPORTS OF MEETINGS.

Arden Vale and Wyacca, August 10.

PRESENT—Messrs. M. Eckert (chair), A. Eckert, O. and P. Hannemann, E. and W. Klingberg, Starr, Williss, Paynter, Miller, and Pearce (Hon. Sec.) and four visitors.

ARBOR DAY. — The Hon. Secretary gave an account of the Arbor Day celebrations at Wyacca recently. The following trees were planted:—Ten sugar-gums, five pepper-trees, five Remarkable pines, and five poplars, all of which were supplied by the Education Department free of cost. Ten almond-trees and a number of native gums were also planted. Some of the trees planted last season had grown over 5 ft. during the year.

WHEATS FOR HAY.—Mr. Miller stated that his experience was that early, medium, and late wheats, mixed in equal parts, made an excellent hay much relished by stock, which thrived well on it.

IRRIGATION.—The Hon. Secretary read a few notes on this subject. He pointed out the splendid results obtained from irrigation at Renmark and the reclaimed swamp-land on the River Murray. He next referred to the scheme just commenced on the Pekina Creek, at Orroroo. In his opinion it will make that town one of the busiest and most thriving in the North, as everything pointed to the success of the scheme. He hoped that the day was not far distant when a similar scheme would be carried out on the Kanyaka Creek, near Gordon, where the conditions were just as favourable, if not more so, than at Pekina. He was firmly convinced that in the Arden Vale and also the Yarrah and Wyacca Valleys, situated on the Mount Arden Creek, an abundance of artesian waters could be obtained by boring. He further stated that boring would serve the double purpose of testing the land for water and also for gold and coal. Some time ago the iron flux taken from the Comstock Mine showed a fair percentage of gold, when treated at the Port Pirie smelters. He felt confident that coal would be discovered in payable quantities, as, though he was not an expert, he found the formation of the country very similar to that of the Rhondda Valley, near Cardiff, in the Old Country, with which he was well acquainted and which produced the best house and steam coal in the world. He thought it would be advisable to endeavour to have the country tested by Mr. Brown, the Government Geologist, for these several purposes. If a good supply of water were obtained, it would enable the growing of fodders and so stimulate the dairying-industry. It could also be used for intense culture and raisin-growing. The valleys around here were unsurpassed for these several industries, providing the water was procurable. A good discussion ensued, and it was decided that the Government be asked to send Mr. Brown to this place for the purpose of inspecting the country and reporting on the various matters brought forward by the Hon. Secretary.

QUANTITY OF SEED IN DRILL BOX.—Members wished to know whether the drill will, on the same gauge, sow more seed per acre when the box is nearly full, than if kept as nearly empty as possible. [We have no definite information on the subject; but members could, however, easily find out for themselves by practical test with a given quantity of wheat on a measured area of land.—ED.]

Balaklava, July 11.

PRESENT—Messrs. Neville, Anderson, Thomas, Pearson, Kelly, Robinson, Goldney, Ratten, Tuck, Spillane, Baker, and Uppill (Hon. Sec.).

NITROGEN BACTERIA.—Considerable discussion took place on the question of the use of commercial preparations of nitrogen bacteria. Mr. Robinson dealt at length with the results of experiments in America and Europe, many of which had been satisfactory. He pointed out, however, that this system of fertilizing the soil could only be applied indirectly to cereal crops; that is, the bacteria cultures would have to be used first on a leguminous crop, such as peas, beans, lucerne, etc., and that owing to the more vigorous development of these crops the land would be improved for a succeeding cereal

crop. He thought that this system of inoculation would only be profitable where the soil was naturally deficient in these nitrogen bacteria. Mr. Robinson tabled plants of lucerne showing the characteristic nodules on the roots. Mr. Pearson stated that in parts of India good crops of wheat were grown after peas or other leguminous crops without any direct manuring. In the colder and wetter parts of South Australia nitrate of soda was often used as a topdressing for hay crops with good results. He knew of land in the South which had been growing hay crops for fifty years, and by the growing of peas occasionally the land was better than when it was first broken up. The Chairman stated that one of his paddocks during four years had received mineral superphosphate to the amount of 4 cwt. per acre. This field when out of crop was very thickly coated with clover; when cropped it produced heavy yields of both hay and grain.

Belalie North, August 7.

PRESENT—Messrs. W. Heithersay (chair), Gulliage, Tremlett, O'Leary, H. S. Heithersay, Cummings, Simpson, Bradtke, Arndt, Atkin, and F. D. Bladon (Hon. Sec.) and nine visitors.

FALLOWING.—Mr. J. Gulliage initiated a discussion on fallowing. He stated that it was necessary to commence fallowing as soon as convenient in July. The advantages of early fallowing were the eradication of all weeds and getting the land into a more friable condition. The land should be harrowed across the furrows immediately after being ploughed, and should not be allowed to remain until the surface became caked or set. The harrows would cover the seeds of all weeds which would make rapid growth after the first rains. The depth of ploughing in this district should not average more than 4 inches. If deep ploughing is resorted to the weeds would not start until the land was worked the following year. He advised farmers to work their fallow well, and not allow the surface to become baked, as the moisture evaporates more quickly than when the land is always kept in good tilth. Members agreed with the views expressed by Mr. Gulliage.

BOT-FLY.—Mr. P. O'Leary drew attention to this pest, and stated that precautions would have to be taken to guard against the danger of this insect amongst horses.

Brinkworth, August 11.

PRESENT—Messrs. Davis (chair), Heinjus, Wundke, Ottens, Wood, Stott, Brinkworth, and Hill (Hon. Sec.) and two visitors.

DRY-FARMING.—The Hon. Secretary gave a short review of the Campbell system of dry-farming as described in the *Journal of Agriculture*. He thought that generally the system was very similar to that practised in this district, except that subsoiling and subpacking were not carried out here. He favoured fallowing the land from three to five inches deep, according to the nature of the soil, then harrowing it down and cross-cultivating it to a depth of about three inches when the weeds had got a start in August or September. Mr. T. Brinkworth agreed with the Secretary, and explained the principle of subsoiling. He did not think it would suit the soil in this district. He preferred summer-fallowing, and if the land set hard ploughing it again in the winter to a depth of three inches. Harrow and cultivate later on to destroy the weeds, and then harrow again after every rain, to secure as fine a tilth as possible. Mr. Stott spoke of subsoiling as carried out on Mr. A. Kelly's farm in the earlier days, and the benefits derived from it. Mr. Heinjus was not in favour of subsoiling or deep-ploughing in this district. Mr. Davis gave his experience of deep- and shallow-ploughing and cultivating in the district of Riverton. He expressed himself in favour of shallow ploughing, and working the land well after every rain with the harrows and cultivator.

Butler, August 10.

PRESENT—Messrs. Butler (chair), Barr, Young, Aird, Harrowfield, Cowley, Williams, Ottaway, Trembarth, and Phillis (Acting-Hon. Sec.) and five visitors.

FALLOWING.—Mr. Phillis read a short paper on fallowing to the following effect:—The advantages from fallowing are chiefly the conservation of moisture in the soil, and in scrub land clearing it of roots and bushes. He thought it advisable to fallow as early as possible, as the land worked better in a moist condition, and was able to absorb a larger portion of the winter rains. As regards the depth of ploughing, he considered 3 to 4 in. quite deep enough in this district, but in this matter each farmer would need to exercise his own judgment. Stubble-land would require to be worked with the cultivator or skim-plough. All shoots should be cut, and loose stumps and stones carted off the fallow. In the discussion which followed members considered that the fallow should be harrowed at least twice during the spring and summer.

Carrieton, August 13.

PRESENT—Messrs. Gleeson (chair), Manning, Ormiston, Beerworth, O'Halloran, Williams, Kaerger, Leo, Cogan, Steinke, and Bock (Hon. Sec.).

DRY-FARMING.—Mr. Beerworth stated that according to the report of the Surveyor-General land with a rubbly subsoil was not suitable for cultivation on the dry-farming principle. Some discussion ensued on the matter, and it was decided that the Director of Agriculture should be asked to choose a site for the Dry-farming Experimental Plots to be established in this district.

SHEEP ON SMALL HOLDINGS.—Mr. Ormiston read a paper on this subject to the following effect:—“The fact that sheep can be profitably kept on small holdings in districts where the rainfall is sufficient for wheat to be grown with success has been proved beyond doubt during the past few years. But in this district, where wheat-growing is gradually giving place to grazing, the monetary profit alone can be taken into consideration, without allowing for the useful work done by sheep in clearing the fallow, and thus saving labour and implements. Taking the average land in the Carrieton district he thought sheep could be more profitably kept on holdings of 3,000 acres or more than any other class of live-stock. On smaller holdings horses or cattle could be more safely kept. Breeding lambs for export is the most profitable for small holdings, and he considered the Merino, without any cross, the best ewe for this district. Though slower in reaching maturity, the pure-bred Merino has this advantage—if not sold for freezers they may be kept for another year, when they cut a more profitable fleece than the Shropshire or other crossbreds. The first essential is the selection of good breeding-stock, rams with big frames from some approved flock, and ewes from some of the stations noted for their large-framed Merino sheep. For lamb-raising large-framed sheep should be selected, even at the expense of a little less valuable fleece. Stations in the Middle-North and some north of Carrieton sell annually ewes suitable for lamb-breeding purposes, and though they may be a little higher in price are cheaper in the long run than a less suitable type. In this district it is difficult to ascertain the actual carrying-capacity of the land; it varies so much in different seasons, but generally speaking 500 breeding ewes or about 750 dry sheep can be carried on an area of 3,000 acres. Over-stocking is a very risky policy, and it is better to err on the side of under-stocking. A smaller number of sheep well kept will yield a higher return per sheep with less trouble than a larger number badly kept. In the dry spells the man lightly stocked always comes out on top. Rabbits are largely responsible for reducing the carrying-capacity of land, and to make grazing profitable they must be kept in check. The wild-dog is the greatest drawback to profitable sheep-breeding. The erection of dog-proof fences further north has caused the pest to become a greater nuisance here than ever before. All sheep have now to be yarded at night, unless in a paddock enclosed with a dog-proof fence. To keep the dogs out the fence must be over 5 ft. high; 3 ft. 6 in. wire-netting with barb-wire on top, or else netting to the height of 5 ft. This means a heavy expense. Lambs for export ought to be dropped about the middle of April, with the lambing-season of not longer than six weeks' duration. The lambs are then of an even size. There need be no fear of lambing on dryfeed with plenty of water, provided there is greenfeed for the lamb when it commences to graze for itself. In a fair season they should be ready for freezers by the end of September. Taking a low estimate of values, a flock of 500

ewes with a 90 per cent. lambing, with 8s. net for the lambs and the wool from the ewes at 5s., would give a return of £305. On rough country, and where sheep have to be yarded, store-wethers would probably be the most profitable sheep to keep. When sold as fats a good class of Merino will realize nearly double the price of inferior types, without any extra feed or trouble. Before going in for sheep, a man has to take into consideration the cost of fencing, the wild-dog pest, and the water supply." In the discussion which followed Mr. Manning stated that he could live happily on his holding if it were not for the wild-dog.

Cherry Gardens, August 11.

PRESENT.—MESSRS. C. Ricks (chair), T. and A. Jacobs, Hicks, Broadbent, C., Jno., and Jos. Lewis, Partridge, Wright, G. and I. Ricks, J. and G. Brumby, and Curnow (Hon. Sec.) and five visitors.

PLANTING FRUIT-TREES.—The Hon. Secretary read a paper on this subject to the following effect:—To one about to enter into the fruit-growing industry as a means of livelihood, several serious points present themselves for consideration. He must, for instance, first decide what particular branch of the industry he wishes to enter. If for growing fruit to sell in a dried or dessicated condition, he must take care to select a district where the climate is favourable to sun-drying, this being preferable to artificial heat. On the other hand, if he intends to trade in fresh fruits, he must take into consideration the questions of transit and market facilities, besides favourable climatic conditions. Great care and judgment must be exercised in the selection of orchard lands. In some of the warmer districts of the State, with a rainfall up to 25 inches, a greater variety of fruits can be grown to perfection than is the case in this district. Take, for instance, the peach, apricot, and nectarine, all of which cannot be profitably grown here; the tree lacks the productiveness and the fruit the quality of those grown in warmer districts. He thought this locality best adapted to the growing of apples, pears, and plums. He did not favour the planting of apples and pears in poor land. Though the trees sometimes do well in appearance, they nevertheless prove unprofitable. The most profitable orchards were those that are situated on the strong hillside slopes or rich alluvial gullies. He did not think apples could be grown on too rich a soil, provided it is kept well drained and aerated. In this district, this year, some trees had yielded as many as 30 cases of apples each, and those of good quality. Stone-fruits, when grown here, should be kept on the hill-slopes, as the quality of the fruit is improved thereby. He was of opinion that it would pay to work the land to a depth of 15 to 18 inches when preparing land for planting. By a thorough cultivation of the soil the foods are more readily found and assimilated by the trees, and a more vigorous growth results. Better drainage is also obtained, the water passing more readily through the soil to the lower levels of the orchard. He preferred the septuple system of planting, with the trees twenty feet apart. This leaves ample room for the mature development of the trees, and facilitates the cultivation of the orchard. He believed that, if it were possible, it would pay to raise all stone-fruits from pips planted in their permanent positions in the orchard. He knew of peach-trees so raised 50 years ago, and they still bear very good fruit; also apricot-trees over 30 years old that had never been transplanted, and which were still profitable. In raising trees in this way it would, of course, be necessary to bud or graft whatever variety is deemed advisable. In planting worked or other trees, he thought it an advantage to severely dock the large main roots: it is desirable to encourage deep rooting in the trees. The tap-root having been destroyed, an effort should be made to replace it as nearly as possible, and by severely docking the main roots a direct downward tendency is established directly at the base of the tree. Where the land is not trenched or sub-soiled, a good hole of moderate depth should be sunk, and if the soil is poor, a little bone-meal should be applied at the time of planting. This gives an impetus to the growth, and enables the tree to establish itself the first season. Some discussion followed. Messrs. C. and J. Lewis thought sub-soiling unnecessary in this district, while Mr. T. Jacobs thought it assisted in the drainage of the orchard. Mr. Jacobs did not believe in manuring fruit-trees, even when young.

Clare, July 10.

PRESENT—Messrs. Jarman (chair), Kollosche, Kimber, Daly, Victorsen, W. Kelly, Pascoe, Knappstein, Berridge, McKenzie, I. and C. J. Radford, and E. H. Kelly (Hon. Sec.).

MARKETING CURRANTS.—Mr. P. M. Daly initiated a discussion on this subject. He pointed out that at the present time the producer had all the work, worry, and risk of production, and after having battled more or less successfully with these he had to accept whatever prices the merchants thought fit to offer. He thought the time had arrived when the growers should unite, and by united action endeavour to place matters on a more satisfactory basis in the interests of both themselves and the consumers. The existing state of things was very unsatisfactory. There was no system of grading or packing currants or other dried fruits, each grower preparing his own produce as best he could, and selling how, when, and where he could. He was sure that if properly handled this important industry would result in infinitely greater benefit, not only to this district, but to the State generally.

Clarendon, August 10.

PRESENT—Messrs. H. C. Harper (chair), J. Wright, sen. and jun., W. and E. Burpee, A. and A. A. Harper, Sheidow, Morphett, J. and L. Spencer, Dunnell, Davidson, Piggott, Brooks, and Phelps (Hon. Sec.) and one visitor.

HARROWING GROWING CROPS.—Mr. Burpee wished to know whether members had any experience in harrowing growing crops. The Hon. Secretary stated he always harrowed his crop across the drills with sharp harrows, even where the soil was light, very few wheat plants being destroyed. It was a check to the weeds if the harrowing was done early. Mr. A. A. Harper had harrowed his crops twice last year, and the result was so satisfactory that he would go over them three times this season if the weather were favourable.

PLANTING APPLE-TREES.—Mr. Harper asked whether members would advise cutting back apple-trees when planting. Members favoured cutting back when planting, but would not prune too hard until the tree came into bearing, as hard pruning promoted too much growth of wood, especially in good land.

POTATOES.—Members stated they had got better results from imported seed than from that grown locally. Mr. Harper thought it would pay to give the land a dressing of lime. Some members had sprinkled lime to dry the sets and prevent them being destroyed by slugs.

Cradock, August 8.

PRESENT — Messrs. Clarke (chair), Solly, Gillick, Marshall, McAuley, Hilder, and Richards (Hon. Sec.) and one visitor.

CROWS.—Mr. Clarke made mention of the damage crows had done to his crop, and wished to know of a remedy to eradicate or check the pest. He showed some droppings of crows which consisted largely of the refuse of wheat grains, and even the green plants and roots which had either passed through or been disgorged by the crows. His crop was hardly one-third as thick as it would have been but for damage by crows. Mr. McAuley said he had adopted the following method for killing crows that were troublesome to lambs:—"Put some Vernox preparation in a kerosene-tin, and dip some large pieces of meat in it; take them out immediately and allow the excess to drip off; then throw the meat where it will attract the crows." He estimated that he had killed about 300 crows in this way.

Crystal Brook, July 11.

PRESENT—Messrs. Forgan (chair), Venning, Pavy, Shaw, Morrish, Clarke, Weston, Kelly, Solomon, Townsend, H. and S. Billingham, Miell, Hutchinson, and Cowled (Hon. Sec.) and one visitor.

ANNUAL REPORT.—The Hon. Secretary submitted his annual report. During the year ten meetings had been held with an average attendance of a little over seventeen members. The following are some of the subjects discussed at the meetings:—"The Standard Wheat Question," "The American Grain Certificate," "Catch Crops," "Rabbit Destruction," "Rural Education," "Horsebreaking," "Ewes for Breeding Lambs for the Market," and "The Work of the late Wm. Farrer." The sixteenth Annual Conference of the Northern Branches was held at Crystal Brook on February 19, when delegates from various Branches and two members of the Advisory Board were present. Eleven new members were enrolled during the year, while the names of five were struck off the roll for non-attendance.

Cummins, August 10.

PRESENT—Messrs. R. Siviour (chair), Cooper, Mitchell, Hill, Coulthard, Thring, Nosworthy, Fuss, Durdin, Hamilton, Brown, Potter, and W. H. Siviour (Hon. Sec.) and eight visitors.

PIGS ON THE FARM.—Mr. Mitchell gave a short address on the best breed of pigs for farmers. He thought it paid handsomely to keep a few pigs on the farm, as there was always a lot of waste which could be fed to pigs at a profit. He favoured the Berkshire pig crossed with the Poland-China, and if another cross were required, he thought a good result would be obtained by crossing back again with the Berkshire boar. He considered the Berkshire the best all-round pig. The cheapest, and, in his opinion, the best way to keep pigs was to have, say, two small paddocks from eight to ten acres; one of these could be left as fallow and the other sown for early green-feed and the pigs turned on it. A good discussion ensued. Mr. Thring stated that last year he had killed two pigs at two years old, and sold them at 4d. per lb., realizing £11 10s.

Davenport, August 6.

PRESENT—Messrs. Bothwell (chair), Roberts, Holdsworth, Bryant, Messenger, and Lecky (Hon. Sec.).

WHEAT COMMISSION.—Mr. Roberts reviewed some of the evidence given before the Wheat Commission. He said he could bear out the statement made by Professor Angus in regard to rubbish in wheat. He had had long experience in the cleaning of wheat after it had been delivered by farmers to the mill. What with drake, barley, oats, smut, chaff, etc., fully one bushel out of twenty-four was rubbish. As to the wheat-bag, at the 1907 Congress he contended, amidst a storm of opposition, that the wheat-bags were too large. He thought it was very unfair that the wheat-merchants and millers should combine to control the wheat market to the disadvantage of the producer. Considerable discussion followed. Mr. Messenger questioned the benefits to be derived by farmers joining the Farmers' Union. They did not seem to get any better prices from it than the "combine" was offering for their produce. He thought farmers were very heavily handicapped through this lack of competition, and in the matter of corn-sacks, implements, etc., they were also entirely in the hands of the merchants.

Dawson, August 8.

PRESENT—Messrs. Renton (chair), Kennedy, Meyers, Watkins, Burden, Hughes, Carmody, Warner, Nottle, Smart, G. and W. A. Wilson, and Hodges (Hon. Sec.).

DAIRYING.—Mr. Kennedy read a paper on this subject. In introducing his subject, he emphasized the suitability of the district for this industry. The dairy-herds here were composed mainly of the various breeds recommended by the Dairy Experts. Shorthorns were being much advocated of late as combining a fair-size frame with good milking-qualities. Reference was also made to the Jersey and Ayrshire breeds. Mr. Kennedy favoured the Shorthorn as a whole, though they were rather inclined to beef produc-

tion. He said a good deal could be done towards raising the standard of a dairy-herd by a judicious selection of heifers. The question as to when a cow was at her best was a very open one. He thought it was a matter of maturity and development in different cows. It was a mistake to judge or condemn a heifer on the first year's results, unless she was an absolute failure or had some serious defect. Some cows reached their zenith at six or seven years, while others matured earlier. Some could be kept from twelve to fourteen years provided their teeth were good. In the matter of feeding, he was of opinion that it paid to feed cows well. Profits might be small for a time, but it was bad policy to let a cow get in low condition. He made a practice of endeavouring to have his cows come into milk about February or March, milking them until the end of December, a period of nine or ten months, according to the condition of the cow. It was easier to dry off a cow in summer than when greenfeed was plentiful. A good cow should, under favourable circumstances, return a clear profit of £10 per annum, while the average for a dairy-herd should be about £8, allowing a small proportion for aged cows and heifers. The returns from the progeny and the feed for pigs should not be lost sight of. Briefly summarized, the essential points were regularity in milking, separating the milk immediately after milking, strict attention to every detail, and provision made in the milking-yard for shelter and sanitation. Discussion of the paper was held over until next meeting.

Forest Range, August 8.

PRESENT—Messrs. F. Green (chair), A. H. and J. Green, Rowley, Vickers, Waters, McLaren, Mason, Collins, Hale, and Monks (Hon. Sec.) and one visitor.

APPLES AND PEARS. — The question was asked by a member whether it was sufficient to single-work apple-trees in the nursery instead of double-working them. Members were of opinion that to secure blight-proof trees it was necessary to double-work them. It was not considered advisable to plant the Cleopatra apple on the high ground in the district; members preferred the Jonathan. The statement by the Premier that apples were sold in the Old Country on the sample of one apple was referred to. It was decided that the Branch compete at fruit shows held in England, and a committee was appointed to select, grade, pack, and forward the apples next year. Information was sought as to the best varieties of pear-trees to plant in the district, and the Duchess, Beurré Clairgeau, and Lemon Bergamot were mentioned as three good varieties. [Mr. Quinn, the Horticultural Expert, states that if by the Duchess is meant Williams' Bon Chrétien, that pear up to the present has only been suitable for local markets where the demand seems to be good, particularly as this variety is now being dried freely; and it seems likely that under improved methods in the near future it may be exported. Beurré Clairgeau has not carried well on the whole, and has not kept well locally under test in cool storage. Glou Morceau has proved a better pear in most localities for export purposes. The Lemon Bergamot is essentially a local market fruit. Beurré Bosc is spoken of highly as an export variety, as is also Josephine de Malines.—ED.]

Forster, August 8.

PRESENT—Messrs. W. Towill (chair), Johns, Searle, Scarfe, A. and W. E. Towill, and Payne (Acting Hon. Sec.).

ECONOMY ON THE FARM.—Mr. Payne read a short paper on "Economy on the Farm" to the following effect:—The most successful farmers of to-day are those who have studied economy on their farms. There are many ways in which a farmer can do this, the first and most important being to save and conserve as much fodder during good seasons as possible for feeding to farm stock during dry spells. It is a great mistake to destroy or burn any cocky-chaff, as this is a feed that will always help to keep the stock in fair condition in bad seasons, when a little bran or pollard is mixed with it. He did not advise using it in its raw state, as then it is likely to cause impaction and result in the loss of both cattle and horses. A good stack of straw if gathered soon after stripping has been found beneficial to feed

to stock during cold, wet weather. A small blacksmith's forge and a few tools are also the means of effecting a great saving on the farm. He also referred to the best time for watering a team of working horses, which he considered to be before they are fed. The horses will keep in better condition on less feed by doing this. He had seen this mentioned in *The Journal of Agriculture* some years ago, and having tried it could bear out the statement. Farmers who have got large tanks at their wells and ball-taps on the troughs should use only shallow troughs. Care must be taken to keep the water as pure as possible. Some discussion followed, members generally expressing the opinion that they preferred feeding grain with cockychaff.

GRAIN FOR GREENFEED.—Mr. W. Towill wished to know the best grain to sow for greenfeed. [Probably barley will give the best results, though some of the early wheats, if sown early, can be fed down, and will still give a good yield of grain.—Ed.]

Fowler Bay, August 8.

PRESENT—Messrs. Giles (chair), Riddle, Leicester, Winter, and Atkins (Hon. Sec.) and two visitors.

FALLOWING.—In a short discussion on this subject members expressed themselves in favour of shallow ploughing, as in deep ploughing the sour sub-soil is liable to be turned up.

SCOURS IN HORSES.—Mr. Riddle wished to know a cure for horses scouring badly on greenfeed, inflammation setting in and resulting in death. [Veterinary-Surgeon Desmond states that he cannot advise on this matter until particulars are supplied as to the nature of the greenfeed.—Ed.]

Gawler River, August 7.

PRESENT—Messrs. A. M. Dawkins (chair), Hillier, H. Dawkins, Spencer, Roediger, Hayman, and Winckel (Hon. Sec.).

HORSE DENTISTRY.—Mr. Hayman read a few extracts dealing with this subject. He thought that if the teeth of a horse were well looked after much suffering could be avoided, and mentioned a case where a horse had lost a tooth and the opposite tooth had grown so long that it cut into the jaw bone. Some discussion followed, and members agreed that much good would result if the teeth of horses were occasionally examined by a competent man. Slobbering is a sure indication that something is amiss, either a loose tooth or some sharp points projecting, causing irritation.

Golden Grove, August 13.

PRESENT—Messrs. Maxwell (chair), Milne, Ross, and Harper (Hon. Sec.).

SOMETHING ABOUT EGGS.—A paper on this subject written by Mr. Lyon was read by the Hon. Secretary. "Eggs are perhaps not the least important product on the farm. The egg trade is one which is receiving considerable attention in England, that is a very large importer of eggs. Distance no doubt prevents Australian importers from competing successfully with the countries nearer home. Even 'infertile' eggs cannot be considered fresh when they reach London from here, though they were 'new laid' only three days prior to shipment. What may be termed 'best' eggs are always scarce in England. There is an inexhaustible demand for this article. There are several firms in London which weekly require 40,000 or so of the best eggs. One is reputed to buy a million in a year for sale at 2d. each. The National Poultry Organization Society has orders weekly for 40,000 to 60,000 more than it can supply. The trade cannot obtain from the home production more than one-third of what it requires. During the past twelve months there have been something like 160,000,000 fewer eggs imported into England from abroad. There is also an enormous outlet in England for the

cheaper eggs. These are required by the poorer classes, and also by the various trades and manufactures, such as bookbinding, embrocation compounding, glove-making, biscuit factories, etc. One English writer states: "Nearness to market and the colour of the egg tell. The farther the exporter is from our shores the smaller his return, and the more brown eggs in his consignment the higher the payment he receives." French eggs reach England four to six days after being taken from the nest; Italian about eleven, and Russian from twenty-eight to forty. For brown Danish new-laid eggs shippers are receiving 6d. per 120 more than for white ones of equal size and quality. Just why this is cannot be determined, except that the English public prefers the brown egg. The quality and flavour of an egg depend not on the colour of its shell but on the feeding of the fowl that lays it. In England the value of the egg is assessed by its size, colour, and freshness. In Adelaide and elsewhere in South Australia, however, size apparently makes no difference in price. The freshness of an egg is determined by a process known as "candling." An egg which has been sat upon by a broody hen would show a darkening of the yoke. An egg not more than three days old, if properly kept, is transparent. In a "new-laid" egg the air-space should not be bigger than a threepenny-bit, while in an egg fresh from the nest there should be no air-space at all. Egg preservation in a small way is now practically confined to two methods, viz., lime and waterglass. The following is a report on waterglass experiments by Jas. Hendrick, Esq., B.Sc., which was published in the *Journal of Agricultural Science*: "Eggs which had been kept in waterglass for a few months could hardly be distinguished in appearance, flavour, or smell, either raw or cooked, from what are called 'fresh eggs'—that is, fresh eggs in the commercial sense, as applied to eggs free from decomposition or taint, but which may be several days old. A really fresh egg, only a few hours laid, is easily distinguished in flavour and appearance when cooked from the 'fresh egg' or preserved egg, and is known as the 'new-laid' egg. The eggs which had been preserved for about six months tasted and smelt like well-kept eggs a few days old, as the eggs in question were not appreciably changed to my eye or palate by a few months' stay in waterglass. As the eggs get older, however, a distinct change is found, which can be appreciated by both the eye and palate. Eggs which have been three or four years in waterglass are easily recognized. The white becomes pink in colour and very liquid; the egg acquires a slightly peculiar taste, which to my palate suggested soda. At the same time, even when four years old, the eggs had no unpleasant taste or smell, and the white coagulated in the usual way in cooking. Though there was a slight characteristic odour when the eggs were cooked, it was not a stale or bad smell, and did not suggest sulphuretted hydrogen (a very close resemblance to rotten eggs). The changes in the preserved eggs take place very gradually. The first year they are hardly noticeable, at two years they are distinct, but not so distinct as at three or four years old." Some discussion followed. Mr. Milne stated that unless systematically managed poultry would not be profitable on the farm, while the Chairman thought this district too cold for winter egg-production.

Inkerman, August 11.

PRESENT—Messrs. T. Smart (chair), Lomman, Gregg, Williams, Saint, Daniel, and F. Smart (Hon. Sec.).

CARE OF HORSES.—Mr. J. Lomman read a short paper dealing with this subject. He stated that although the motor is likely to supplant horse-power by degrees, the horse would still hold his own for many more years to come, and deserved all the care and attention it was possible to bestow upon it. The feeding of the horse should on no account be neglected, good hay-chaff being preferable to any other. Where only wheaten chaff could be obtained, it was a good plan to damp it down with a little water and treacle. The horse should be occasionally given a course of reliable condition powders to keep him in good health. Where the horse is called upon to do heavy work, the collars should always be well seen to. The collar should be a good fit to prevent galling. Where the collar does not fit too well he found it a good plan to pack it with a bran-bag. Some discussion followed the reading of the paper.

Kanmantoo, August 5.

PRESENT—Messrs. J. Downing (chair), Mills, Hair, W. Downing, Lewis, Shepherd, and Lehmann (Hon. Sec.) and several visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. W. G. Mills. During the day an inspection was made of some fine merino rams and ewes.

CAROB BEANS.—The Chairman tabled a sample of carob beans, both whole and crushed; he used them for feeding pigs. The trees from which they were taken were about twelve feet high.

IMPROVEMENT OF PASTURES.—Mr. Mills read a paper on the improvement of grass-lands. In introducing his subject Mr. Mills referred in general terms to the work of the Bureau, which, together with *The Journal of Agriculture*, he considered a very real source of education to the South Australian farmer. He then drew attention to the evident decreasing grazing-power of the hills in the district. He had noticed in an article in the *Pastoralist's Review* that the same thing applies to New Zealand. Lands there that formerly carried five sheep to the acre and kept them fat would now scarcely carry two and a half sheep per acre. It was suggested in this article that each paddock should be grazed with cattle for a year in turn. This, however, would hardly appeal to the sheep-breeder, as the returns from sheep are greater and the risks less. The dairying-industry does not seem to make much headway here, partly perhaps on account of the continued labour required, and partly due to the risk of loss of cattle. Manuring was not practicable on a large portion of the lands, and he thought there were but few who could afford to close their paddocks down to allow the grasses to go to seed and produce a thicker crop the next season. He had tried as an experiment sowing some grasses thickly in rows in a cultivated paddock, and they promised to turn out a success. But after grazing some sheep on them he found to his dismay that they had practically pulled the young plants all up by the roots. This proved the wisdom of resting the grass-lands as far as possible from the time of the first autumn rains until well into the spring, when the young plants have obtained a firm hold. To enable this to be done the cultivation of early winter fodders would have to be practised, such as kale, rape, barley, and perhaps turnips or kohlrabi. There was considerable scope for experiments in this direction. The paper was well discussed. Rabbits were thought to be the cause of reducing the carrying-capacity of pasture lands, and united efforts should be made to keep the pest in check; also, wire-netting fences should be erected. A visitor stated that his practice for nine years had been to keep out all stock from June to February to allow the spear-grass to root firmly. He then grazed wethers or cattle on it—not ewes and lambs, as they were "grubbers." A paddock of 650 acres which would previously carry only 200 sheep now carried 400. He had greatly improved his pastures in this way. Mr. A. D. Hair made reference to the Roseworthy Agricultural College lands, where three to four sheep are grazed per acre. He thought this was due to the heavy dressings of manure the land had received. Mr. Thomas Hair, of Victoria, thought it would pay farmers in this district to go in for a threshing-plant, as the straw was very valuable to stock in the winter-time, and could be saved for years. The charge of threshing in Victoria was from 6d. to 7d. per bag. Mr. P. Lewis said he had applied a dressing of 1 cwt. of superphosphate to his grass-lands, and they were showing well ahead of the unmanured blocks.

WASHES IN LAND.—Mr. W. Downing wished to know the best method of preventing washes in land. He had some on his land 8 ft. deep and twice as wide. Mr. E. Downing said that on his sandy lands he sloped the banks down, placed logs across, and carted old chaff and straw on them. This caused a good growth of grass, which helped to bind the soil. Mr. Mills used stones and furze, and the Hon. Secretary found that by placing stones across the watercourses every few chains they would silt up and prevent washing.

ANNUAL REPORT.—The annual report was submitted by the Hon. Secretary. During the year 11 meetings had been held, at one of which the Government Poultry Expert (Mr. Laurie) had lectured on poultry. Papers on the following subjects had been read, "Poultry," "Potato-growing," and "Country Labour," besides which several interesting discussions on various subjects had taken place. A visit of inspection was made to the Roseworthy Agricultural College, and the Chairman had attended before the Wheat Commission to give evidence on behalf of the Branch.

Koolunga, August 6.

PRESENT — Messrs. Sandow (chair), Button, Palmer; Jose, Butterfield, Perrin, and Cooper (Hon. Sec.).

AGRICULTURAL BUREAU WORK.—Mr. R. H. Palmer read a paper on this subject to the following effect:—Practical agriculture is becoming more and more a science, and the man who is content to jog along in the good old way will soon find he has been left behind by the more up-to-date and progressive cultivator. Looking at other countries besides our own, and studying the manners and methods followed by progressive agriculturists, we find there never has been such a time as at present of research and experimenting, and of anxiety to wrest from Dame Nature her secrets about soils, plant-food, fertilizers, etc. What seemed to him deplorable was that the farming community of this State was not properly organized; every man seems to stand apart from his neighbour. Other trades and callings have their unions and organizations, and why should not farmers be better organized? At present they stand practically alone, and consequently, as a body, they cannot exert the necessary influence on public opinion. Union is power, and the common interests of the farmer demands it. If such unionism existed among wheat-growers, would there then be to-day that vexed question of the standard bushel of wheat? Or would the farmer have to accept the price fixed by the merchant for his wheat? Assuredly not; for the farmer would have a voice in fixing the standard and the price. He would like to see the Agricultural Bureau become that force, that power, in the land, which would sweep away the disadvantages and the injustice which prevail to-day. To effect this the Branches must be made popular and the meetings interesting and instructive. Their object ought to be to create and encourage interest in agriculture in its various forms, and to spread useful knowledge among the producers—in short, the Agricultural Bureau should be a mutual improvement society. It should be the means of furnishing to the young generation of farmers an education to fit them for their work, and be the voice of the country on all questions touching the wellbeing of the producer. There are existing to-day a large number of Branches, and each Branch is supposed to hold a meeting every month; but a considerable number of them hold but few meetings during the year. Then, again, the attendance at the meetings is deplorable. Even this Branch has a difficulty in keeping up the membership to fifteen, whereas in such a district it should be thirty or forty. Scanning the reports of Branches for the past year or two, there seems to be a lack of real interest, a want of go and determination, and an absence of responsibility which promises a speedy and unnatural death to many of the Branches. The reason is not far to seek: analyze the list of members, and you will place them under one of these heads—1. The working member who attends regularly and does his best to make the meetings interesting and help things along; 2, the shy member who has an enormous amount of information stored away under his hat, but is too shy to give utterance to it; and, 3, we have the indifferent or lazy member who fails to take interest in the meetings. To make the meetings a success and to maintain interest requires united as well as individual effort. Every member must recognize he is a part of the machine. It is not an easy matter for a few, month after month, to fill up the programme, and it is not fair. All should help, and all can help. There are some members who say it is beyond them to get up a paper or give an address; but meet them in the field, and you will find that they have a store of useful information, and yet when their turn comes they will not come forward. There are numbers amongst us who have had years of experience at farming, and whose experiences are worth relating, but they are shy. Then, again, we have men brimming over with ideas of how things ought to be done. Well, let those men bring forward these ideas. It is desirable that they be made known and their practicability discussed. Then, again, we have the handy man on the farm who has a knack of making contrivances that save time, labour, and money. Let him bring those to our meetings; in fact, anything and everything that will make the meetings instructive. Let every member bring anything that may have arrested his attention during the month, such as plants, grubs, weeds, tools, labour-saving appliances, etc. Let him speak at least once on every subject introduced for discussion, and bring a visitor who may be interested, and perhaps become a member. Why should not the Branch possess a small library of works on farming, manures,

treatment of stock, and other useful subjects? This could be accomplished by a small donation, wherewith two or three books could be purchased every year. The books could be loaned out to members for a month at a time. Further, every member should conduct experimental work on his farm. By these means he can discover the wheats most suitable for his farm, and also keep the different varieties pure. Members must be on the look-out for matters of interest appearing in the papers, and bring newspaper clippings to the meetings; others may not have read them. A good discussion ensued. Mr. Cooper considered that the paper contained some good suggestions, but thought the fixing of the standard was necessary from year to year for trade purposes, and was opposed to the fixing of a standard for all time. Mr. Jose said it was unfair to dock wheat under the standard, and not give any more for that going over the standard. Regret was expressed at the lack of interest in Bureau work, and it was thought that it would be to the advantage of the farmers if they were to unite. The plan of carrying on experimental work at home was a good one.

Koppio, August 13.

PRESENT—Messrs. Brennand (chair), G. B. and M. Gardiner, G. and M. Howard, Newell, Thompson, and F. and R. Richardson (Hon. Sec.).

BARLEY.—Mr. Newell tabled a splendid sample of barley, 3 ft. high, which had been grown on land manured with stable manure.

TREE-PLANTING.—Mr. M. Howard read a paper on this subject. He stated that tree-planting was too much neglected by farmers, not only for supplying timber and firewood in years to come, but also for providing shelter for their stock. At the present time a few old trees are left when clearing the land. These give but little shelter to stock, and in a few years fall over. It is a good plan to plant trees in clumps, as then more shelter is afforded stock than by single trees. They should be planted in June so as to become fairly well established before the summer sets in. It is also advisable to plant fruit-trees around the house with some ornamental trees on the outside of them as a protection from hot winds. Tree-planting may mean a little trouble and expense, but the farmer is well repaid for these, as he not only improves his homestead in appearance, but also adds to its value. In the discussion which followed, members generally agreed with Mr. Howard. One member pointed out that if ornamental trees were planted too near an orchard the fruit-trees would be likely to suffer. Several varieties of trees for shelter were suggested, amongst them gums, Remarkable pines, silver wattles, sheoaks, and carob bean.

STOCK ON ROADS.—At the previous meeting Mr. Newell read a few notes on "Stock Running at Large on Roads." He stated that this was a question causing considerable annoyance to farmers generally, and frequently had the effect of making bad friends amongst neighbours. People who turn their stock out on to the roads—probably to keep them out of mischief at home—should think of the trouble and annoyance they are likely to cause other people. People go to the expense of making their fences stock- and vermin-proof, only to have them damaged by straying cattle. This is no small matter when it is considered that wire-netting costs something like £25 per mile. Sheep in small lots might do good on the roads by keeping the grass down to prevent fire, but personally he would sooner chance the risk of fire than have the trouble caused by roaming stock.

Kybybolite, August 6.

PRESENT—Messrs. Bradley (chair), G. H. and C. Hahn, Lacey, Wilson, Scholz, Bartram, Farrow, Smith, A. Debney, Bail, and O. S. Debney (Hon. Sec.) and six visitors.

Co-OPERATION.—A letter was received from Mr. A. Molineux calling attention to an article appearing in *The Garden and Field* on this subject. As there was no over-production in this district of the things dealt with in the article, further discussion was abandoned.

FALLOW.—Some discussion took place on this subject. Mr. Hahn said he had not been favourably impressed with fallow in this district during

the past two years. He thought that if fallowing were carried out late, say in October, it would be more successful. It was mentioned by some that fallowed land had not compared favourably with newly-ploughed ground, and it seemed to be the general opinion of members that the heavy rains during the past few years had been detrimental to the effect of fallow.

Lameroo, August 15.

PRESENT—Messrs. F. W. Eime (chair), H. W., E. J., and W. J. Trowbridge, Sinclair, Marshall, Ross, Kentish, and R. and A. J. A. Koch (Hon. Sec.) and six visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. H. D. Kentish. The wheat crops were inspected, the variety showing up best at the time of inspection being a plot of Silver Bart which was sown early; this was about 6 inches high, healthy, and strong. Attention was then directed to the sheds which had been substantially erected of iron during the short period Mr. Kentish has been on the block. Tea was kindly provided by Mrs. Kentish.

VERMIN EXTERMINATION.—A paper on this subject written by Mr. E. T. Wray was read. It had been his experience that trapping was the best method to deal with the rabbit in this district. The farmer has many opportunities to look after traps without much loss of time; for instance, when ploughing the traps may be seen to night and morning, as also when scrub-rolling, fencing, etc. The little time spent on this was not wasted, and well repaid the trouble. Digging out the burrows was also effective, but he thought more could be caught by trapping. Once the land was cleared he did not think much trouble would be experienced in keeping the rabbits in check. He urged the necessity for united action in this matter, and considered it the duty of every farmer to destroy the pest. The paper was well discussed, and several cheap and effective methods of destroying vermin were suggested. Blocking the hole with paper and earth or placing a piece of bag dipped in tar in the burrow, setting light to it, and then closing the burrow were considered worthy of trial. One member suggested placing a netted trap with a valve-door over the burrow, as in this way not even the small ones could escape.

EXPERIMENTAL PLOTS.—Mr. Eime reported on the experimental plots that were being worked by him under the direction of the Department of Agriculture. They were sown a little late to suit the later varieties. He had sown 43 lb. of seed and 70 lb. of manure to the acre. The land on which they were sown was of even quality. There were six varieties, of which Bobs looked best, then came Majestic and Federation. The last-mentioned was not growing or stooling so well as it usually did. Mr. W. J. Trowbridge stated that he had sown some Kubanka wheat from the Department of Agriculture. At present it was a good, strong, narrow-leaved plant, dark-green in colour, and stooling well.

SUMMER FODDERS.—In reply to enquiry, Mr. Marshall stated that Amber cane was the best summer fodder for cattle in this district. It should be broadcasted about the end of September on fallow ground at the rate of about 3 lb. of seed to the acre. He had had good results from rye and Steinwedel wheat sown together, with 1 cwt. of manure per acre for early winter feed.

Lipson, August 8.

PRESENT — Messrs. Provis (chair), Carr, Dunow, Barraud, McCallum, Bratten, A. B. and G. Wishart, Christie, France, Partington, and Potter (Hon. Sec.).

HARROWING GROWING CROPS.—Mr. Provis wished to know members' experience on this matter. Mr. Barraud did not think that it would benefit crops in light soil, but in heavy soil he would roll the crop and then harrow; this should prove beneficial.

SAMPLE OF WHEAT.—Mr. A. B. Wishart tabled a sample of King's Early wheat, 3 ft. 6 in. high, not out in head, which he had taken from a crop of fifty acres.

Maitland, August 1.

PRESENT—Messrs. Tossell (chair), Bawden, Bentley, Hill, Heilemann, Jarrett, Senr. and Junr., Lamshed, O'Grady, Treasure, and Pitcher (Hon. Sec.).

ANNUAL REPORT.—The hon. secretary submitted his annual report, which showed that nine meetings had been held during the year with an average attendance of nearly nine members and two visitors. Several papers had been read and discussed and other items of interest brought forward for discussion.

Mallala, August 3.

PRESENT—Messrs. Loller (chair), J. and A. V. Nairn, Marshman, Hancock, Temby, Murphy, F. and J. Jenkins, McCabe, Griffiths, Jarmyn, Worden, and Nevin (Hon. Sec.).

MOTORS ON THE FARM.—Mr. G. Marshman read some extracts dealing with motor-power on the farm. The development of the motor as a means of locomotion had inspired farmers with the hope that it might supersede the present costly use of horse-traction on the farm. Accounts of tests of motor-power in the operations of harvesting and ploughing in the Old Country were given, and while they did not afford conclusive proof of the adaptability of the motor to farming-operations, they were prophetic of much greater success in this direction. Reference was made to the increasing cost of suitable horses for farm work, and any economy that could be effected by a change of power would be welcomed. Members contended, however, that the success hitherto attending the use of motors on the farm did not warrant the risk of their more extensive adoption. Some members were doubtful whether the horse could be wholly dispensed with; others considered that the success already attained in stationary engines would in a short time be applicable to traction-engines.

Meadows, August 10.

PRESENT—Messrs. Ellis (chair), Brooks, Griggs, Warren, Stone, Nicolle, Smith, Bottrill, and Morphet (Hon. Sec.), and two visitors.

LAND ON WEST COAST.—Mr. Bottrill gave an address dealing generally with lands along the West Coast. He said that the land along the coast north of Port Lincoln is some of the best for farming in the State. On land a few miles inland which has been worked for a number of years as much as eight bags to the acre has been reaped. Most of the farmers obtained the best results from fallow that has been thoroughly cultivated. Now that it has been proved that farming can be successfully carried on in that district, farmers are flocking there from all parts of the State, and flourishing farms are taking the place of the scrub. The nature of the soil varies considerably, but most of it consists of limestone, ironstone, or a rich red loam, all very easily worked. Phosphates are profitably applied, but he had seen a crop there as an experiment sown without manure which was looking very well. Last year, the season being unusually dry, the late crops did not do so well as the year before. Where the broom-bush grows there seems to be a subsoil which causes the crop to grow quickly during its later stages.

EXPERIMENTAL ORCHARD.—Members took exception to the proposal that the Agricultural Department should establish an experimental orchard on private land in the district, as in their opinion there were thousands of acres of more suitable land owned by the Government.

Millicent, July 31.

PRESENT—Messrs. Oberlander (chair), McRostie, Hart, Holzgreffe, Mullins, Stewart, Mutton, Bird, Hogan, Major, Legoe, Day, Harris, and Thompson (Hon. Sec.).

CULTIVATION OF HOPS.—In reply to question, the hon. secretary stated that some twenty years ago the late Mr. Rich had grown a quantity of hops at Millicent with success.

FROZEN-LAMB INDUSTRY.—Mr. Holzgreffe delivered an address on this subject. He referred to the superior quality of the New Zealand lambs when compared in the market with the South Australian article. He also pointed out the advantages enjoyed by the New Zealand graziers in having a freezing-depot almost invariably within a few miles of their paddocks, and compared with these the unfavourable conditions under which the industry is carried on in the South-East. Mr. Hart suggested a sea outlet for South-Eastern produce as an obvious solution of the difficulty. Mr. Holzgreffe said it was nonsense for outsiders to say that boats would not call any more frequently if freezing-works were established along the coast, and Mr. Harris contended that if a port were selected the freezing-works would follow as a matter of course. The seaboard was the only place where a freezing-depot could be successfully established. Mr. Harris was of opinion that if the farmers pulled together they could establish a freezing-depot at Beachport in a very short time, and the Government would take the produce without a doubt. Mr. Harris stated that a lamb depreciated in value to the extent of 2s. 6d. during the railway journey between Millicent and Adelaide, to which Mr. Legoe replied that it was not always the fault of the railway authorities. Farmers were not altogether guiltless of damaging a carcass. It was quite a common practice to grab a lamb by the wool and lift it about, while the use of sticks and poles to jamb them into railway trucks was quite a popular method with consignors. A discussion then followed on the preparation of freezers for the market. Mr. Stewart observed that the tails should not be allowed to grow, as a short tail gave a frozen lamb a better appearance. Mr. Bird thought that if trucks were divided into four compartments instead of two it would be an improvement and lead to a decline in the death-rate.

SUMMER FODDERS.—Mr. Hogan asked what was the best crop to grow as early summer feed for dairy-cattle. Mr. Holzgreffe said he had learnt from experience that maize was the best crop to grow, as it did not taint the milk. He recommended planting it in drills 21 inches apart, and mixing the seed with ashes or other manure, the whole to be sown from the manure-box. All weeds should be destroyed between the drills. Autumn was considered the best time for sowing lucerne, as it then had the advantage of the early rains.

FERTILIZER ANALYSES.—Mr. Major referred to delay in publication of official analyses of fertilizers. It was resolved to ask that the report should be published in March, as by May, when usually issued, the farmers had mostly completed their purchases for the season. [The Inspector of Fertilizers points out that in taking samples for analyses he makes it an invariable practice not to take them from anything but manure which is bagged ready for delivery. If samples were taken from bulk-heaps they *might* not be representative of the manure as actually distributed. Consequently, as the fertilizer distribution season commences about the middle of January, only a comparatively small number of samples have been obtained by the middle of February. Further, if the results available were published in the March issue of *The Journal*, it would mean that scarcely any of the imported manures would have been secured by that date. Special effort will, however, be made next year to have the analyses published as early as possible.—ED.]

Millicent, August 18.

PRESENT—Messrs. Stewart (chair), Harris, Oberlander, Mutton, Hogan, Varcoe, Holzgreffe, Legoe, Major, and Thompson (Hon. Sec.).

POTATOES.—Mr. Oberlander tabled some fine samples of Snowflake potatoes grown on the edge of the Wyrie with the aid of potato-manure. Mr. Mutton considered the Up-to-date, Beauty of Hebron, and White Elephant varieties specially suitable as early seed, while good results were also obtained from Redskins. Members agreed that black soil was better than sand for potato-growing in this district. Mr. Legoe thought that if a man were sent to Adelaide to look after the interests of the Millicent potato-growers more would be heard of the local tubers on the market.

FOX PEST.—Mr. Harris initiated a discussion on this subject. He had poisoned as many as seven in a forty-acre paddock in one night. Mr. Holzgreffe stated he had great success in killing foxes by means of poisoned birds. Members generally considered that the fox scare was nothing more than a bogey.

ANIMAL AILMENTS.—Mr. Harris considered stockholm tar a sure remedy for distemper in dogs if applied in its early stages. The treatment is very simple—merely dipping the dog's nose in tar three or four times a day. Mr. Hogan thought gunpowder and fat a good remedy. Mr. Harris also gave the following prescription for mange:—"Three parts boiled linseed oil, one turpentine mixed with flower of sulphur." One application of this to the dog's coat would suffice. In his opinion it could also be used for horses. Mr. Harris further informed Mr. Holzgreffe that he had cured strangles in horses by the aid of Condry's fluid and carbolic oil. The animal should be isolated while affected by the disease. In the early stages much good could be done by putting a nosebag containing bran on to the horse's head, and then applying hot water to the bran, and afterwards oil of eucalyptus. Mr. Major recommended baking-soda in milk as a cure for sand in horses, while Mr. Mutton said he had found pollard very beneficial in this connection.

SHEEP AILMENTS.—Mr. B. Varcoe read a few extracts from an article written by Professor Perkins in *The Journal of Agriculture*. One cause of mortality in sheep was set down to stinkwort, and the symptoms were described. These symptoms, Mr. Varcoe stated, were identical with those he had noticed in portion of his own flock, but the sheep had died in paddocks containing no vestige of stinkwort. Mr. Legoe stated that a few days ago he had noticed an apparently healthy ewe take a leap into the air and then fall dead. The body became putrid within a remarkably short space of time. Mr. Varcoe said he had been told by a leading breeder that the turning of the body of a lamb in a ewe was responsible for a number of deaths, particularly amongst the crossbred types. Mr. Major stated that he had lost a valuable mare from the same cause, and could have saved her life had he known how to treat her at the time.

SIZE OF CORNSACKS.—This question also came in for some discussion. Members said that it would affect the use of all classes of agricultural machinery, such as wheat-graders, winnowers, threshers, etc., which would all have to undergo alterations to suit the new bag.

Miltalie, August 8.

PRESENT—Messrs. Atkinson (chair), Fairbank, Jacobs, Story, Smith, F. M. and A. B. Grund, and Heir (Hon. Sec.) and ten visitors.

POULTRY ON THE FARM.—The Hon. Secretary read a paper on "How to keep poultry on the farm at a profit." He did not intend to deal with the question of show poultry, but just the ordinary farm fowl. It is essential to secure a good laying strain and look after the fowls well. It is surprising to find how many farmers expect to get a good return from their fowls without going to the trouble of taking care of them. He had kept fowls for a number of years, and had no hesitation in saying that they paid well for any trouble spent on them. They should not be kept too fat, as a lazy fowl will never make a good layer. The best way to feed fowls was to make them scratch for their grain, either in loose, dusty ground, or in cocky-chaff spread about; the latter is the better, but it means more trouble. As to breeds, the farmer should select from his flock only the best layers, and use the rest for table purposes. To do this it is only necessary to look over your flock at feeding-time. The hen with the bright eye and red comb is sure to be the best layer of her respective breed. Of course the condition of the fowl must be taken into consideration, for no hen looks her best when she is moulting or poor. The pullets that start laying first generally turn out best, but some breeds commence earlier than others. The rooster should be pure-bred if possible; never less than half-bred between two pure breeds. Such breeds as the Leghorn, Minorca, and Andalusian are splendid layers, and known as non-sitters; but he thought the farmer needed a fowl that, while being a good layer, was not too small for table purposes. He had tried a variety of breeds, and could recommend the Wyandotte as the best all-round bird for farmers. They are of a nice size, fast growers, and very good winter layers. A cross between the Leghorn and Wyandotte produces a nice bird, but like the Leghorns, they are non-sitters. Sittings should be made as early as possible, so that the chicks will be strong enough to stand the hot weather. August, September, and October were the best months for chicks, with March, April, and May next. If hens are set to hatch chicks during the last-mentioned months the

pullets will lay when eggs are dearest, but the chicks require much greater attention. It was a good plan to separate a pure-bred rooster and three or four pure-bred hens (not blood-relations) from which to breed, in order to keep up the stock on the farm and improve the breeds. About half a teaspoonful of sulphur in a little olive oil is a good thing to clear the blood of a fowl. Dead fowls should never be left about, but should be buried to prevent the spread of disease. A liberal supply of pure water should be given, and care taken to prevent tick, as when once this gets a hold amongst the fowls it is difficult to get rid of. Hens over two years old are not profitable, and those over that age should be killed off. In the discussion which followed a member wished to know how best to tell an old fowl from a young one. [Mr. Laurie, Government Poultry Expert, replies:—"This is a question that has puzzled many, and will continue to do so. It is hard enough to tell a pullet from a hen, although the former generally has a lot of hair on its body. As a rule, a very hard breast-bone, somewhat horny on the ridge, a worn, wrinkled look round the eyes, and, in some cases, worn, broken claws and spur-development, may be relied upon; but then we have cases of hens a year or eighteen months old which, from appearances, might easily be taken to be several years old."—ED.]

Morphett Vale, July 21.

PRESENT—Messrs. A. C. Pocock (chair), R. Pocock, Hutchinson, McCloud, Rosenberg, O'Sullivan, J. H. and E. Perry, and Anderson (Hon. Sec.) and one visitor.

CULTIVATION FOR SUMMER CROPS.—Mr. R. Pocock read a paper dealing with the question of "Winter Cultivation of Land for Summer Crops other than Lucerne," to the following effect:—"To successfully produce a good crop of summer feed, i.e., sorghum and maize, it is essential that the land should lie as fallow during the winter. It should be ploughed up deeply in the autumn, having been previously manured, if possible, with stable manure. It is a debatable point as to whether the manure should be applied at ploughing-time or later, as the winter rains leach considerably the available plant-food in the manure. Leave the land in a rough state during the early winter and work down, say, at the end of July or the beginning of August. If not previously applied, the manure should be applied at this time and lightly ploughed in, or it may be left on the surface until the end of August. The land should then be given a good, deep scarifying and be worked down to a fine tilth. It is essential that a good tilth is obtained, and for this purpose a heavy harrow is particularly suited. To break the land down, the roller should not be used. A good tilth is best obtained by breaking down with the harrows when the land is fairly wet, followed, in drier weather, with the cultivator. The depth of cultivation depends on the depth of the surface soil. Shallow soils are of little use for summer cropping unless overlying a retentive subsoil. Sowing may be commenced at the end of September or beginning of October. In districts where the lucerne-flea is prevalent it is well to sow later. Planting is most effectively done by sowing through the manure-box of the ordinary seed-drill, mixing the seed with the manure. [Seed mixed with manure should be sown within a few hours of mixing.—ED.] In well-worked soil sow pretty thickly, and, when the plants are up, harrow the land across the drills with good, sharp harrows so as to thin out the plants. This, also, serves as a cultivation, and should be done when the soil is fairly dry. The seed should be sown in rows about 28 in. apart, i.e., missing every three hoes of the drill, and the space between the drills should be kept well cultivated to conserve the moisture and destroy the weeds. Of the sorghums, the most satisfactory variety for this district is Amber Cave, being a midseason variety. Maize should be sown a little thicker in the rows than sorghum. Corbett's Corn is usually sown as an early variety, while Horsetooth is a good later variety. It is a good plan to have a plot of each, as when one is done the other is ready for cutting. Millets are sometimes grown as a summer fodder. They have been successfully grown at Morphett Vale, and are worth a trial. The treatment is similar to sorghum. It is very rarely that a good summer crop can be grown on land cropped during the winter for greenfeed, as such a good tilth cannot then be obtained as in the case of fallow, nor is the moisture conserved to the same extent. Some discussion followed. Mr. Hutchinson stated that crops of beans and peas

could be grown without the aid of nitrogenous manures, and Mr. Pocock remarked that if such crops were ploughed under, and mineral manures added, they would have the same effect as farm-yard manures for summer crops. Mr. E. Perry wished to know whether sorghum could be grown successfully after maize. The Chairman replied that, where the land was good and well worked, it might be done. Mr. J. Perry asked whether it was too late to plant mangels. Some members thought this was the best time for this district, while others favoured the March-sowing. Mr. R. Pocock stated that the usual rotation of crops was: 1, root crops; 2, shallow-rooted cereals; 3, leguminous crops; 4, wheat.

MANURING CROPS.—Mr. F. W. Hutchinson also read a paper on how to grow crops and how to find out what manures these crops required. He stated that many farmers and gardeners copied their neighbours' methods, when these had better crops than they, without knowing the why or wherefore of the system. This should not be in this modern age; it was the duty of every farmer and gardener to know something of the chemical constituents of manures and plants. When phosphates were first used in this district people ridiculed the idea, but the results of experiments had proved the value of this fertilizer. The producer should go hand in hand with the scientific man; the former could learn a lot from the scientist, while the latter was also partly dependent on the practical man. When selecting a manure for any crop he ascertained the chemical properties of the plants, and then chose the manure that would be most likely to supply these. This was the secret of the success he had obtained in the crops of turnips and swedes about which mention had been made some time ago. These yielded 27 tons to the acre without the tops, which weighed another 4 tons. Before purchasing manures the farmers should be careful to get the analyses of the different brands. They should make certain that the analysis states whether the phosphoric acid is water-soluble or not. The water-soluble form is usually the best, but they would find out for themselves, as they went along, which kinds of manure suited their soil and also the different crops grown. Phosphoric acid, potash, and nitrogen are the three properties most drawn upon, and by keeping up the fertility of the soil in these a considerable advance will have been made towards success. They are all supplied by farm-yard manure, but not in a sufficient quantity. Commercial fertilizers must therefore be availed of, care being taken in their selection, viz., whether they are to be water-soluble, citrate-soluble, or acid-soluble. The first-mentioned would probably give the best results. Winter-manuring was in his opinion the most profitable for summer crops; the rain may take them into the subsoil, but it must be remembered that summer crops are deep-rooted. Without a good, retentive subsoil it was, of course, useless to endeavour to grow summer crops without irrigation. His land was of a medium to a poor sandy type with a clay subsoil at a depth of 10 to 12 inches. He often grew two crops in one year, viz., peas first, and then tomatoes, melons, or other similar crop. He never fallowed, not because he did not believe in it, but because he could not spare sufficient land for the purpose. The paper was well discussed.

Morphett Vale, August 24.

PRESENT—Messrs. Pocock (chair), McCloud, J. H. and E. Perry, Rosenberg, Hunt, O'Sullivan, Jones, Sprigg, and Anderson (Hon. Sec.).

WHEAT AFTER PEAS.—Mr. Hunt stated he had a crop of wheat on fallowed land. Part of this had grown a good crop of peas, then lay as pasture the next year, and last year was fallowed. The portion upon which the peas had been grown was very poor, while the other portion which had lain as pasture for two years previous to fallowing was looking well.

RAPE.—Mr. Sprigg wished to know the best time to sow rape. Mr. Pocock said if it was required for winter feed it should be sown in time to get the benefit of the first rains, but if for summer feed it might be sown in August in this district.

MANURES FOR FODDERS.—In reply to enquiry, Mr. Pocock said he thought superphosphates the best fertilizer for maize and sorghum.

FEEDING-OFF CROPS.—Mr. Sprigg enquired whether there was any advantage to be derived from this practice. Some members thought that such

wheats as Tuscan, Bluey, etc., might benefit from it, but other varieties such as Silver King and kindred wheats would not, as the stock would be likely to eat the heart out of the plants.

Mount Bryan, August 8.

PRESENT—Messrs. Wardle (chair), Evan, Collins, Connors, Schoenberg, Hatherly, Tralaggan, Dunstan, Dollard, Schmidt, and Kelly (Hon. Sec.).

CO-OPERATION IN AGRICULTURE.—Mr. E. K. Collins read a paper on this subject. He said that there were few countries in the world where so much progress is being made in agriculture as in Ireland at the present time. After passing through generations of poverty and depression the agriculturist there is now facing brighter prospects. Landholders in other parts of the world would do well to study the results achieved of recent years in Ireland in the matter of the settlement of people on the land. Co-operation playing an important part in this direction. Conditions in Australia are exceedingly favourable to co-operation, and there was nothing peculiar in the conditions existing in Ireland that would render co-operation of greater advantage there than elsewhere. The countries which to-day command the highest prices on the market for their produce are almost, without exception, those in which the co-operative principle is adopted. In Denmark a portion of the labourer's wage is made up out of a percentage of the profits. Co-operation binds together the whole of the agricultural industries, which no doubt, accounts to a large extent for the independent and comfortable condition of the producer, and the high quality of the goods produced. The Irish egg-trade has been organized on the same lines as in Denmark, the sorting and packing being carried on at a central depot, under the supervision of a Danish expert. Co-operative stores are important features in the rural industry in Ireland. The middleman's profits are done away with, which results in a reduction of price to producers for their household supplies, machinery, implements, etc. Another big impetus has been given the industry by the co-operative method of obtaining loans. This is effected by a number of landholders combining to pass certain loans through financial institutions, each one making himself responsible for the loans obtained. Individual borrowers are thus placed in a more favourable position, as the local combination can consider their application for a loan from the broader standpoint of character and capacity, and not alone from the hard-and-fast rules of security and valuations. The aim of co-operation in Ireland has been to help to a position of comparative independence men working on small holdings with but little capital behind them. The same principle might be adopted in Australia to the benefit of both the producer individually and the State as a whole.

Mount Bryan East, August 8.

PRESENT—Messrs. J. Thomas (chair), Teddy, Wilks, Gare, H. Thomas, Wilkins, Dare, and R. Thomas (Hon. Sec.) and two visitors.

WILD-DOG PEST.—It was reported that wild-dogs were becoming very prevalent in this district. Messrs. J. Simmins and Miller & Sons have been destroying these dogs, and members thought it a fair thing that they should be paid for their time and trouble, as all sheep owners in the district benefited. Mr. J. Thomas was asked to collect subscriptions towards paying for dogs so destroyed.

Mount Gambier, August 8.

PRESENT — Messrs. Ruwoldt (chair), Bodey, Wedd, Edwards, Buck, Mitchell, Schlegel, Sutton, Kennedy, Cobbledick, Niquet, Clarke, Kilsby, Major, and G. and D. Collins (Hon. Sec.).

ANNUAL REPORT. — The Hon. Secretary submitted his annual report. During the year eleven meetings had been held, with an average attendance of fourteen members. Six papers had been read on a variety of subjects, viz., "Root Crops," "Loupin-ill" or "Braxy," "Harvester v. Thresher," "Best Fodders and Grasses to Grow," "The History of the Rabbit in Australia," and "How Best to Destroy the Rabbit." Several discussions had taken place on various subjects. He referred with regret to the death of

Mr. M. C. Wilson, who for the first eighteen years of the Bureau's existence had greatly assisted it by providing a furnished room in which to hold meetings. Mr. Clarke had conferred a boon on potato-growers by introducing a new potato from Italy with satisfactory results. The Chairman also gave a short retrospect of the year's work.

ANNUAL CONGRESS.—Mr. Sassanowsky suggested that the date of holding the Annual Congress of the Agricultural Bureau should be changed. The week of the Adelaide Show was a very inconvenient time for it, as the delegates had no time to attend the sessions regularly, nor had the Government Experts. The Bureau was quite strong enough now to fix a week of its own. If the Congress were held on another date, not only could the delegates attend all the sessions, but the Experts also; and the Government would have the opportunity of taking them round to see the various manufactories of the city. He thought about the second week of August would be suitable. After considerable discussion it was agreed that the week before the September Show would be most convenient, and it was decided to bring the matter before Congress.

MURRAY SWAMPS.—It was suggested that the delegates should make an inspection of the Government Experimental Farm on the Murray swamps when returning from the Annual Congress. The manager (Mr. McIntosh) had the consent of the Government to show any farmers over the plots, which were most interesting and instructive.

Mount Remarkable, August 6.

PRESENT—Messrs. Giles (chair), Yates, Smith, Morrell, George, Chaling, Foot, Bauer, O'Connell, and Catt (Hon. Sec.).

FARMING.—Some discussion took place on this subject, and the statements made by Professor Custance at the May meeting of the Georgetown Branch were criticized. Members considered that his figures for produce were much too high and expenses too low, and were apt to create a wrong impression of the profits to be made on a farm. Mr. T. P. Yates tabled a splendid sample of wheat-plant 4 ft. 2 in. high, with sixty stems. It had been grown on land off which two tons of hay to the acre had been taken last September. The land was then ploughed and kept well cultivated till March 21, when the present crop was sown, several days after a fall of rain, with a dry spell following. He considered the success obtained in the present crop due to the extra amount of working the land received in the summer to conserve the moisture. The subject of dry-farming was also commented on, and members generally agreed with the principles of the system.

Mundoora, August 15.

PRESENT—Messrs. Aitchison (chair), Mildren, Arbon, J. and W. Stringer, Carman, Owens, Reu, Gardner, Dick, Dolling, J. and W. Shearer, and Harris (Hon. Sec.) and six visitors.

FARM LABOUR.—Some discussion on this subject took place, and it was agreed that if climatic conditions continued favourable there would be about thirty additional labourers required during the harvest. The question of the proposed railway from Port Broughton to Brinkworth was discussed and approved of.

Nantawarra, August 5.

PRESENT—Messrs. Herbert (chair), Dixon, Sleep, Greenshields, Belling, Dal, and Gosden (Hon. Sec.).

LAND ON THE MURRAY.—Mr. A. L. Greenshields gave an interesting account of his trip to the River Murray in the vicinity of Mannum. He had been very much pleased with the land he saw there, and had taken up several thousand acres. He tabled samples of soils from different localities, also photographs illustrating production, etc.

Naracoorte, August 8.

PRESENT—Messrs. Coe (chair), Wright, Williams, Duffield, Bray, Caldwell, A. Langeludecke, sen. and jun., and Schinckel (Hon. Sec.).

HARROWING GROWING CROPS.—Mr. G. Williams enquired whether members had had experience in harrowing growing crops. Mr. Bray believed light harrowing would benefit the crop, as it would have the effect of letting the moisture down to the roots and destroying the weeds. Mr. Schinckel thought it would do more harm than good in wet country, but this was an ideal season for harrowing on account of the dryness. In such a dry season as this it would do good to harrow the crops. Mr. Langeludecke, jun., said he had experimented with a crop two years ago and found it beneficial. It depended greatly on the weather. If the weather was dry it would be an advantage.

Narridy, August 8.

PRESENT—Messrs. Flavel (chair), Hodges, Haren, Lehmann, Satchell, Kelly, and Nicholls (Hon. Sec.).

FEED ON STUBBLE PADDOCKS.—Reference was made to the scarcity of feed in stubble paddocks this year, and members were of opinion that something will have to be done to remedy this in the future. Other matters of interest were discussed.

Orroroo, August 14.

PRESENT—Messrs. Dunn (chair), Moody, Copley, Roberts, Robertson, Lillecrapp, and Tapscott (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary submitted his annual report. During the year eight meetings had been held, with an average attendance of seven members. Three papers had been read on the following subjects: "Preserving Milk," "Locust Pest," and "Prevention of Smut in Wheat." Several discussions also took place, and the meetings generally were of an interesting and instructive nature.

Paskeville, August 8.

PRESENT—Messrs. Price (chair), Palm, Koch, Wehr, Goodall, and O'Grady (Hon. Sec.).

FREEZING-WORKS AT WALLAROO.—This question was discussed at considerable length, and it was unanimously agreed that the establishment of a freezing-depot at this port would be a great boon to the district and enable producers to put their lambs on the market in a much more satisfactory condition than at present. The deterioration of the lambs owing to the long period of starvation and the rough handling received in transshipping at Hamley Bridge on account of the break of gauge was referred to.

Penola, August 8.

PRESENT—Messrs. Strong (chair), Wilson, Warner, H. J. and J. Darwent, Alexander, Robinson, Miller, and McKay (Hon. Sec.) and two visitors.

PRUNING.—A paper on this subject was read by Mr. Darwent. He said he would deal first with the planting of the young fruit-trees, for in his opinion a great deal of the success attending the pruner's efforts would depend on whether he had a strong and vigorous tree to work upon. Many people, when planting an orchard, pay more regard to saving a few shillings by buying in the cheapest market than they do to securing strong, healthy trees which are true to name. The best trees to plant are what may be called yearlings—that is, trees that have been worked the year after root-grafting. The younger the tree the less old wood the roots have to find nourishment for, and this allows the roots and branches to expand at the same time. Care should also be taken that the scions are grafted on proper stocks. Apples should be worked on both blight-proof roots and stocks, peach on peach, apricot on apricot, etc., as the union of scion and stock is better when worked on the same variety. In the case of stone-fruits he thought budding better

than grafting. Land ploughed to a good depth is better than digging holes. The soil should be taken out and the subsoil loosened with a fork; put back some of the soil in the shape of a small mound, spread the roots over this, and then cover with the soil, pushing the tree up and down a little in order to get the soil well in around the roots. When the roots are properly covered press the soil down with your feet, and fill up level with the ground. The tree should be planted at the same depth as it was in the nursery. Trees should never be planted with the roots bunched together. The young tree when it comes from the nursery is either one straight stem or has several branches, and the first thing the pruner has to do is to decide what height the trunk is to be. His own practice was to cut it off at a height of twenty inches (in apple-trees), so that the lower branches would start at about fifteen inches from the bottom. In this district apricots and peaches should be started higher, say at about two feet. The first few years should be devoted to shaping the tree, care being taken to leave the branches evenly distributed round the trunk, and on no account should a fork be formed, as the tree is apt to split when heavily laden with fruit. The first year the branches should be cut back to within four or five inches of the stem, to an outside bud; the second year a little longer, and also the third. In the third year side-branches may be left to fill in the spaces between the main limbs, keeping the tree evenly balanced. A little summer-pruning may be done the third year. With apples and pears he found the best way was to cut the laterals and branches not required to about two buds from the base; with apricots and peaches to partly break the branches over the blunt edge of a knife so as to check the flow of the sap, but not stop it altogether, cutting the broken piece off at the winter pruning. If the young branches of the apricot and peach are cut clean off they generally die back, leaving a bare stem. In the fourth, fifth, and sixth years attention should still be paid to the shaping of the tree, but more must be paid to the forming of fruit-spurs, and to do this the pruner must study the variety he is working upon. Most apples will form fruit-buds by cutting back to near the base, as previously mentioned, but some varieties must be left longer, and the short laterals left where possible. The Jonathan and Rome Beauty are of this latter kind. In leaving fruit-spurs they should be trained on the upper side of the limbs as much as possible, so that they will not be knocked off by the horses when cultivating the orchard, and the flowers will also be on top, retaining the spraying ingredients better. Apple- and pear-trees should be trained to eight or ten main limbs, and fairly upright; peaches, apricots, and plums to more of a goblet shape. When the trees are fairly well grown and trained the apple, pear, and plum will require little more than summer-pruning the laterals, and sometimes cutting the head back, but in doing this care should be taken to cut back to a young growth, as if cut back on the main stem it will either die back or form a cauliflower top. Peaches and apricots bear only on the last year's growth, so that the object in pruning these should be to promote fresh growth every year. With peaches he found it most successful to practise what might be called rod- and spur-pruning. They would generally find about three branches shoot out from the headgrowth. One of these he cut out, spurred one back, and left the other for fruit. Next year he cut this one out if not required, leaving the young wood to take its place. With the apricot he had not been so successful. The first few seasons he had spurs developed to the bottom of the branches, but heavy spring frosts killed all the lower ones. The pruner is very often puzzled with trees that have a bad union between the scion and the stock. He had a number of peach-trees on plum-stocks; the stocks were smaller than the trees, and the union had an enlarged appearance. The trees bear fairly well, but very often the lower limbs die off, probably on account of the imperfect flow of sap due to a bad union. In this district summer-pruning should be carried out about the end of January or the beginning of February. He did not think it advisable to clear all the surplus growth in summer-pruning; this would leave the tree practically leafless. It is better to take out or cut back the overcrowding laterals, and leave the uprights to be cut out at the winter-pruning. When trees did not fill out as much with young wood as he wished them to, he allowed them to go unpruned for a season, especially the apricot and peach. As the sap flows upwards, it is always advisable to keep the fruit-bearing wood as near the main stem as possible, so that all the fruit gets an even supply of the sap. Mr. Darwent illustrated with diagrams some of the points mentioned in his paper. Mr. Warner agreed with Mr. Darwent in all particulars, and a vote of thanks was accorded the writer for his interesting and instructive paper.

Penong, August 8.

PRESENT—Messrs. Bennier (chair), Brown, Edwards, Brook, Farrelly, Shipard, and Kelly (Hon. Sec.) and one visitor.

FALLOWING.—Mr. Edwards read a short paper on this subject to the following effect:—He thought good results would be obtained from fallowing, and suggested the following plan for working holdings of 2,000 acres: Put 500 acres under crop, leave 500 for grazing horses and cattle, another 500 as pasture for sheep, and the remaining 500 for fallow. The fallow should be worked as often as possible; the more it is worked the more moisture will be conserved. He thought 5 in. a fair depth for ploughing in this district. Crops should not be sown on anything but fallow, and this applies even to new land. After harvesting, the cattle and horses should be put on the stubble land, and the sheep on the pasture from which the large stock has been taken. The land from which the sheep were taken should be fallowed. By fallowing this rotation very good results would be obtained. Crops from seven to eleven bags per acre had been taken off land treated in this way. The former yield was reaped from a crop sown with 45 lb. of seed and 50 lb. of manure to the acre, while in the latter case 30 lb. of seed and 45 lb. of manure were drilled in and afterwards cross-drilled with the same quantity, making a total of 60 lb. of seed and 90 lb. of manure to the acre. This land produces very much more grass than when in its virgin state. In the discussion which followed members considered that 5 in. was too deep to plough in this district, and thought 3 in. quite deep enough.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. J. M. Edwards. After the business of the meeting had been disposed of, members inspected the garden and crops, and found everything in a flourishing condition. Tea was then partaken of, and a vote of thanks was accorded the host and hostess for entertaining the members.

Port Elliot, July 18.

PRESENT—Messrs. Welch (chair), Parnel, Green, sen., Nosworthy, W. E. Hargreaves, Vince, and W. W. Hargreaves (Hon. Sec.) and one visitor.

EARLY EXPERIENCES.—Mr. Vince gave an address dealing with the drawbacks experienced by the early pioneers of this State. He referred to the bad condition of the roads in the early days and the antiquated methods of cultivation as compared with present-day machinery and conveniences.

SUMMER-PRUNING FOR APPLES.—Mr. A. J. Hancock, of Mount Compass, said that he thought too much summer-pruning on some varieties of apples was liable to bring on fungus diseases. Members considered that summer-pruning was more adaptable to stone fruits.

Port Elliot, August 15.

PRESENT — Messrs. H. B. Welch (chair), Pannel, Brown, W. E. Hargreaves, Green, sen., H. Welch, and W. W. Hargreaves (Hon. Sec.).

IMPROVEMENT OF STOCK.—Mr. H. Welch read the second part of his paper on this subject, in which he dealt with the improvement of cattle. Great care should be exercised when selecting a bull, and he should be chosen according to the lines it was intended to follow, i.e., dairying or beef-production. If for milk, the Ayrshire or Holstein is well suited; for butter, the Alderney or Jersey; and for beef-production, the Hereford or Shorthorn are decidedly the best. The cows should be selected on the same lines as the bull. It would pay to keep a better class of cattle, and he would venture to say that there is as much difference between well-bred cattle and mongrels as there is between a pound weight each of silver and copper. The reckless manner in which the Alderney bulls, lent out by the Government a few years ago, were crossed with all sorts and conditions of cows was in a large measure responsible for the wretched stock that is to be seen in the sale-yards at the present time, and which at two years old were worth about 30s. per head. As a contrast to this, he had seen pure-bred Shorthorns and Herefords sold at Adelaide recently—in good condition, of course—at six to seven pounds per head at twelve to eighteen months old. Mr.

H. B. Welch could testify to the fact that their yearling calves had realized from five to six pounds each. Surely this was some inducement to breed on sound lines. To return to the dairy: what is the use of feeding cows that will give only half the quantity of milk (and that even of inferior quality) that a well-bred dairy-cow should give? There was a great defect which should be remedied, the sooner the better, and that is allowing so many farmers to have a bull running at large. Many people are quite indifferent on this matter. As long as their cows calve at some time or other without any cost to themselves, that is all they concern themselves about. A well-bred calf at six weeks old is easily worth 10s. more than a mongrel. Butchers are becoming more particular as to the colour of cattle, for the reason that colour indicates breed, and in time bad-coloured mongrels will become almost unsaleable. Therefore, keep your breeds distinct, saving only the best calves for the purposes required, and feeding them well.

FRUIT CULTURE.—Mr. W. E. Hargreaves read a paper on this subject. In the discussion which followed members said consideration should be given to the question of stocks on which it is intended to work, as on this depend to a large extent the bearing, growth, and diseases of the tree. They did not advocate grafting peaches on almond-stocks, nor yet on almond-suckers, as the suckers were always shooting up from the bottom of the tree, and caused a lot of trouble to keep them in check. Mr. H. Green, sen., favoured paraffin wax for bandages on ring-barked vines and grafting fruit-trees.

Port Germein, August 8.

PRESENT — Messrs. H. Crittenden (chair), Holman, Deer, Williams, Dahlenburg, Ashby, and Blesing (Hon. Sec.).

FARMING.—Considerable discussion took place on the address of Professor Custance at the Georgetown Branch on "How to farm 500 acres for profit." Members were unanimous in their opinion that the Professor's estimate of income is too high and that of expenditure too low.

CO-OPERATION.—The Hon. Secretary read a paper dealing with the advantages to be gained by farmers and producers from co-operation. He stated that the Australian farmers and producers are admittedly the most conservative class as a whole, each one being content to plod along on his own. It is high time the farmer woke up to the fact that the present is an age of unions and combinations. All the trades, merchants, and even the steamship companies had their unions to prevent competition. True, there was a Farmers' Union in existence in this State, but not one-tenth of the farmers are shareholders or supporters; therefore, on account of limited capital the Union is comparatively powerless. If all farmers and producers in Australia would combine and be loyal to their Union they would constitute a power to be reckoned with. There was nothing to prevent them from establishing their own fertilizer factories, flourmills, or even from owning small steamships for interstate trade. A great deal of dissatisfaction had been expressed lately at the fact that the price of wheat in Adelaide was lower than in Sydney; but it must not be overlooked that South Australia is exporting while Sydney is importing, and shippers and steamship companies will have their commissions and freights. It had been suggested that the Government should step into the wheat market and ship on behalf of farmers; but in his opinion it would be better if the farmers were to combine and do this themselves. Considerable discussion followed, and members agreed that if carried out on sound business principles co-operation would be both practical and beneficial to the farmer.

Port Pirie, July 11.

PRESENT—Messrs. Wilson (chair), Bell, McEwin, Teague, E. B. and H. F. Welch, Davies, Wright, Hector, Smith, Noll, and Stanley (Hon. Sec.).

CAN THE SCHOOL HELP THE FARM?—Paper by Mr. Dow on this subject was read again and discussed at considerable length. [What are the opinions of the members on the points brought forward by Mr. Dow in his paper? —ED.]

BORING FOR WATER.—Mr. E. J. Hector reported on his experiments in boring for water at Valencia. Three bores of three-inch diameter had been put down, and in each case fresh water had been struck after passing through brackish water. At No. 1 bore brackish water was struck between 17½ ft. and 20½ ft., while at 43 ft. fresh water was obtained. The bore was continued to a depth of 95 ft., when another stream of fresh water, rising to within 21 ft. of the surface, was struck. In No. 2 bore brackish water was obtained at 10½ ft. to 13½ ft., then fresh water between 84 and 104 ft. In the third bore, which was sunk from the bottom of a shaft 22 ft. deep, and containing 2 ft. of brackish water, the fresh-water strata were struck at 76 ft. In each case the fresh water was obtained in a bed of sand.

Redhill, August 14.

PRESENT—Messrs. Darwin (chair), Wheaton, Lithgow, Robertson, Button, Stone, and Johnston (Hon. Sec.).

BREEDING PIGS FOR PROFIT.—The Hon. Secretary read a paper on this subject. In breeding, the first consideration should be the selection of the sow and boar. In swine, as in other domestic animals, temper, size, shape, and quality are determined by inheritance. A boar is fit for service at the age of twelve months, but it is better to allow him to become a little older, say eighteen months. A sow should not be allowed to farrow until fifteen months of age, and two litters a year are quite sufficient. Gestation continues for about four months, a variation of thirty days sometimes taking place. Young animals and those of feeble constitution carry their young for a shorter period than older and more-matured sows. A sow remains prolific for five or six years, and a mature sow is a more constant and careful mother than a younger one, and will produce larger litters. When nearing parturition the sow should be placed in a warm sty. A celebrated veterinary has said that a young pig is more tender than a newly-born lamb. The sow should be fed on good, sloppy food to induce a liberal flow of milk. The young pig can be weaned at six weeks old, as he is born with teeth with which to masticate his food. After weaning he should receive plenty of nourishing food, such as skimmed-milk, wheat, or barley, and if taught early to eat grass, at three months old he is able to take care of himself on good grass pastures with a feed of corn at night. Gelding should be carried out at three weeks old, so that the pig has time to recover before being weaned. A liberal supply of fresh water is essential in the care of pigs. It is a good plan in the summer-time to have a pool of water to which the pigs can have access, as in this climate they suffer greatly from heat. Plenty of charcoal and wood-ashes should also be handy, as it is a good cure for acidity of the stomach, to which pigs are liable. It is a mistake to think that because pigs eat almost anything they can digest it. Pigs should never be fed on diseased meat, or they will be rendered unfit for human consumption. No animal is so liable to contagious diseases as the pig, therefore only good, clean food and pure water should be given. The Berkshire is generally advocated as the best-paying breed. Personally he preferred a Berkshire boar crossed with a sow with a little coarse breeding and a large frame. In his opinion such a cross would produce better bacon-pigs than the pure-bred. To breed pigs at a profit, it is necessary to feed them well from the time they are farrowed until ready for slaughtering. He believed it paid best to send the pigs to market rather than to kill at home. Farm-cured bacon will realize about 5d. per lb., while the factories can command from 8d. to 10d. per lb. In the Adelaide market pigs have been selling at the rate of 4d. per lb. dead weight—that is, a pig weighing, say, 150 lb. when killed, would realize about 50s. With good feeding a well-bred pig should weigh 200 lb. and over at twelve months, which is considered the best time to sell them. When sold at this age they realize fully 1d. per lb. more than when sold at three years old, and the cost of feeding is less in proportion to their weight. The pig market is not so liable to fluctuations as the sheep and cattle market [Query.—Ed.]; what the butchers do not want the bacon-curers take. He considered that pig-breeding, if properly managed, is most profitable for the farmer to take up. Considerable discussion followed, members generally agreeing with the paper.

Reeves Plains, July 17.

PRESENT—Messrs. W. Day (chair), Forrest, Hancock, Jenkins, Oliver, Roberts, Work, and V. W. Day (Hon. Sec.), and several visitors.

PRUNING.—Mr. Quinn, the Horticultural Expert, gave a pruning-demonstration at the homestead of Mr. Arnold. Keen interest was taken in the proceedings by the members and visitors, and a hearty vote of thanks was accorded Mr. Quinn and also to Mr. and Mrs. Arnold for entertaining those present.

Saddleworth, August 21.

PRESENT—Messrs. Parker (chair), Frost, Eckermann, Townsend, and Coleman (Hon. Sec.).

WEEVILS IN THE BARN.—Mr. Eckermann stated that by filling the barn with hay the weevil appeared to come away with the hay, leaving the barn free of the pest. Another member said the weevil had been introduced in his place with some maize, and he had never quite got rid of it again.

FARM LABOUR.—Some discussion took place on this question, and fears were expressed that with a good harvest generally the supply of farm hands would be insufficient. Members were agreed that if farmers could secure men whom they could depend upon they would try to find them permanent employment, as though during the slack season and wet weather they would not earn their wages, still their knowledge of the place and methods of work, management of the horses and implements, would make them more valuable than the casual hand who has no interest in the place.

Shannon, August 8.

PRESENT—Messrs. Neate (chair), W. and H. Glover, Megaw, J. and M. Cronin, Kain, and J. J. Cronin (Hon. Sec.) and five visitors.

SCRUB-ROLLING.—Mr. M. Cronin read a short paper on this subject, in which he advocated early rolling. He favoured the small roller, fitted with angle-irons for timber up to 2 in. in diameter; but for heavier timber the larger roller was undoubtedly superior. In the discussion which followed Mr. Glover said he preferred rolling between June and September, but where the scrub is burnt he favoured logging. The Chairman thought the light roller with angle-irons most suitable for the timber in this district. The smaller roller revolved more quickly, and consequently cut the smaller bushes better.

TURNIPS.—Mr. Glover tabled a fine specimen of turnip grown in Shannon. It measured 15 in. in circumference and weighed 5½ lb.

RYE AND BARLEY.—Mr. Glover also exhibited some plants of rye sown in the first week in April, and measuring 4 ft. 2 in. in height, and barley sown at the same time, 3 ft. 6 in. high.

Stockport, August 10.

PRESENT—Messrs. Megaw (chair), Stribling, Smith, Godfree, Whitelaw, Stevens, Howard, Perry, Nairn, J. W. and F. Watts, and Murray (Hon. Sec.) and one visitor.

POLLARDING GUMS.—A member wished to know the best time to pollard gums. [This will depend a great deal on the district. Mostly best results are obtained by pollarding between October and end of November, as the new growth then has time to get hardened before the cold of winter. In very dry districts, however, pollarding during the winter months may be advisable.—ED.]

SHEEP ON THE FARM.—Paper read at previous meeting by Mr. Nairn was well discussed. Members generally were in favour of the lambs being dropped early, in March or early April for preference. Mr. Nairn stated that he had grown rape successfully on the fallow, but at the same time it was an uncertain crop. As far as he could see, growing rape on the fallow was an advantage to the succeeding wheat crop, as the portion of the fallow that was not under rape did not carry such a good crop of wheat the following season. He would sow rape in August, as he then had feed to carry his sheep on until the stubbles were available.

Strathalbyn, August 17.

PRESENT—Messrs. Fischer (chair), M. and W. M. Rankine, Gardner, Watt, Cockburn, Allison, Collett, Humphris, Nicholls, and J. R. Rankine (Hon. Sec.).

PLOUGHING.—Mr. Gardner gave a short address, in which he compared ploughing and ploughs as used in the early days with the present-day system of multifurrow stump-jump ploughs. His first experience in ploughing in this State was at Mount Barker with two horses in a single-furrow swing plough without wheels, ploughing six inches deep at the rate of an acre a day. He spoke in eulogistic terms of the stump-jump plough, but thought it should only be used in rough country, as without coulter it left the ground very uneven where a set plough would do capital work, burying the weeds well, which was most necessary. He considered where it could be done the ground should be ploughed five to six inches deep. He condemned the system of ploughing around the paddocks. Where working a team of six or eight horses, it was best to work them in sets of three and three or four and four, as the case may be, instead of having them all abreast. A horse to every furrow is not enough; one horse more than the number of furrows is needed, and two more where the number of furrows exceeds eight.

FARM LABOUR.—Some discussion took place in respect to the supply of farm labour, and it was agreed that generally the supply of labour in this district was equal to the demand, though there was a scarcity of youths as “knockabout hands” and domestic servants.

Sutherlands, August 12.

PRESENT—Messrs. Stange (chair), Heinrich, E. C. and A. B. Thiele, Byrne, Twartz, Mybus, and Dart (Hon. Sec.).

STOCK-FEEDING. — The Hon. Secretary read a paper dealing with the science of stock-feeding. While the British farmer was often described as conservative and behind the times, it was a significant fact that Great Britain is practically the world's source of supply for nearly all classes of stud-stock. Horses, cattle, and sheep are sent to all parts of the world for stud-purposes, and in his opinion one of the secrets of the Old Country's pre-eminence in this matter was that her breeders had given careful study to the science of feeding. Mr. Dart then referred to the use of molassine-meal, a preparation of molasses which had been introduced during recent years, and which it was claimed was much better for stock than molasses. This meal was now in great demand in England, and its manufacture had increased to large proportions. The Chairman stated that molasses was frequently used by farmers in the Eudunda district.

TOPDRESSING PASTURES.—The Hon. Secretary initiated a discussion on this subject. In England many farmers not only saved all the farmyard manure that they could get, but also the liquid manures, and these were applied with very beneficial effects to pasture-land. Commercial fertilizers, such as bone-dust and superphosphate, were also used with profitable results on pastures. Mr. A. B. Thiele stated that he had used stable manure as a topdressing on grass-land with very gratifying results; while Mr. Twartz mentioned that waste cocky-chaff could also be used for this purpose.

EMMER WHEAT.—The Hon. Secretary referred at some length to experiments in the United States of America with Emmer wheat. This was a bearded wheat, and it was claimed to be very resistant to drought, cold, and rust. In America it was grown for feed-purposes, but in Russia it was largely used for bread-making.

HANDLING GRAIN IN BULK.—Mr. Twartz initiated a discussion on this subject. He contended that it was impossible to elaborate a scheme for handling wheat in bulk in South Australia without inflicting considerable hardship on the farmers in small centres, where the trade would not warrant the building of elevators. He agreed with Mr. Darling's statements at Crystal Brook on the subject. Members generally thought bulk-handling of wheat under local conditions impracticable.

Tatiara, August 8.

PRESENT—Messrs. Saxon (chair), Bond, Killmier, Reschke, E. and H. Prescott, Milne, Ross, Kirby, Guy, and Truman (Hon. Sec.).

CLEARING MALLEE LAND.—Mr. E. W. Prescott read a paper on this subject to the following effect:—He had tried various methods at different times, but experience had taught him that it was best to roll the mallee down in the beginning of March. It is rather a busy time of the year, but it pays best to do it at that time. After being rolled he left it until after the ploughing-season, when he went over it and cut all spring-backs and other bushes. In October it will start to grow again, and it is necessary to take the opportunity of any damp or spare days after harvest to clear and plough around it ready for burning. Burning should be done in March, as this is the end of the growing-season, and a day should be selected with a fair north wind blowing. In this way the mallee receives two severe checks just before the land is cultivated. It is not advisable to plough deeper than $2\frac{1}{2}$ in. on most of the mallee country, as it does not do to turn up the cold clay. A good team should be chosen, and the plough set heavy in order to cut away and pull up as many roots as possible. These should be carted off before the land is drilled in. The shoots will start again in October, and about a fortnight before burning the stubble the shoots should be cut down, which would help to give a good burn. It should then be ploughed again crossways. If this method is adopted there should not be many shoots the next year. He thought it best to sow oats the first year, and preferred the plain roller of about 22 in. in diameter to the large 4-ft. roller.

WILD-DOG ASSOCIATION.—The Chairman referred to the good work done by this Association. During the past year seventy wild-dogs and ninety-four foxes had been destroyed, and he urged all owners of sheep to subscribe to the funds of the Association.

DESTRUCTION OF RABBITS.—Mr. H. Milne wished to know the best way of fumigating rabbit burrows. Members suggested the use of bisulphide of carbon. One member stated that he had tried the following plan with great success: He rolled up a large piece of paper into a ball and placed in well in the burrow, covering it with earth; he then placed another piece near the outside and covered it also. The rabbits that were closed in would not attempt to burrow past the paper, while the rabbits from the outside would not open up the burrow.

LICE ON CATTLE.—In reply to an enquiry the Hon. Secretary stated that sifted wood-ashes were a good remedy; about half a bucketful well rubbed in would rid the beast of all lice in less than a week.

Uraidla and Summertown, August 4.

PRESENT—Messrs. Day (chair), Collins, Willsmore, Hawke, Rowe, R. N. and G. C. Cobbledick, Cutting, Dyer, Hart, F. and J. Johnson, and Snell (Hon. Sec.).

EELWORM IN POTATOES.—Mr. Rowe called attention to statement in the daily Press that potatoes from Tasmania had been rejected at Melbourne owing to their being attacked by eelworm. It was decided that the Department of Agriculture be asked to make full enquiries into the nature of this disease, and to take special precautions to prevent its introduction into South Australia. It was pointed out that owing to seed potatoes being largely obtained from Tasmania special care was necessary. [This matter is having attention. Potatoes have to be accompanied by a certificate of inspection by an officer of the Tasmanian Department, and are again inspected before the consignee can obtain delivery in Adelaide.—ED.]

FARMYARD MANURE.—Mr. R. N. Cobbledick read a paper prepared by Mr. Crawford on this subject to the following effect:—“Farmyard manure is the oldest and still the most popular of all manures. It has stood the test of long experience as one of the most important fertilizers, and it is, therefore, a matter of considerable moment to the cultivator, when owing to its absence or inadequate supply he has to look around for a substitute for it. To approach this problem in a proper manner it is first necessary to understand something of the action of stable manure when applied to the soil. This may be dealt with under three sections—chemical, physical, and biological. Looked at from a chemical point of view the value of stable

manure as a fertilizer is much over-estimated. It contains but small quantities of the three chief plant-constituents, and these three are not present in the best proportions for the use of plants. Further than this, until certain changes take place, these constituents are not available to the plants. If it were only a matter of the quantity of the fertilizing constituents in stable manure, it would have fallen into disuse long ago, as these constituents could be more economically applied by means of commercial fertilizers. The chief virtue in stable manure is in its physical effect on the soil; it adds organic matter to the soil, which in turn is changed to humus, the presence of which in sufficient quantity has a marked influence on the fertility of the soil. One effect of humus is that it adds to the water-absorbing and -retaining qualities of the soil. Then, when added to clay soils it has the effect of opening them up for better æration and renders them more friable. It will be recognized that in considering the question of replacing stable manure, wholly or partially, the matter of the supply of humus must be kept in mind. Humus is formed when organic or animal matters ferment in the soil, and, consequently, if such can be obtained in sufficient quantity, the stable manure could to a certain extent be dispensed with. An important constituent of humus is nitrogen, and this varies in quantity according to the source from which the humus is derived, and this must be considered. In addition to stable manures, humus may be added to the soil by the process of ploughing-under a green crop, or applying a dressing of seaweed. By heavily manuring a green crop and then ploughing it under the supply of humus can be speedily added to, and this system is deserving of more consideration than it has received in the past. The humus from a green manure crop contains plant-food in forms in which it is readily available to crops, and also in suitable proportions. Green manures could be roughly divided into two classes—those which obtain nitrogen from the air as well as from the soil, and those which can only utilize the soil nitrogen—the former consisting of leguminous plants, such as peas, beans, clover, etc., add to the supply of nitrogen; the latter simply return to the soil the nitrogen they have previously assimilated from the soil. Although the application of seaweed does not give such good results as green manuring, still it adds humus containing a fair percentage of fertilizing constituents. The amount of salt contained in seaweed that has been exposed to the rain is very small and not likely to be at all injurious; in clay soil it may be distinctly useful, owing to its mechanical and chemical action. Seaweed-manuring is certainly worthy of some attention, especially where the material can be obtained for the cost of carting. In some countries, indeed, seaweed is highly valued, and although there are considerable differences in the qualities of different seaweed, it has been found by practical test that the material from our beaches contains a fair proportion of nitrogen.”

Wepowie, August 13.

PRESENT—Messrs. Halliday (chair), T. and A. J. Gale, Chrystall, Rielly, Crocker, Roberts, and J. and T. F. Orrock (Hon Sec.) and one visitor.

DEHORNING CATTLE.—Mr. J. Orrock read a paper on this subject to the following effect:—The practice of dehorning cattle was not in vogue to any large extent here, but those who have carried it out speak very favourably of it. The operation may be painful at the time, but the pain is of short duration and not to be compared with the injuries sustained when cattle are crowded in railway trucks, sale-yards, and even milk-yards. Stock-owners at present are justly indignant at the delay and rough handling dealt out to stock on the railways, but the dehorning of cattle would go a long way to improve matters. Different methods are employed for this purpose. Caustic potash is sometimes used; applied to the “buttons” of young calves it will check the development of the horns. Most people prefer clipping the horns off grown cattle with clippers of very strong leverage, and if done quickly and carefully the pain is not great. Milch cows are much quieter in the milking-yards when dehorned. Some discussion followed, and a letter on the subject from a member of the Wilmington Branch was read. Members were somewhat divided in their opinion on this matter, and while some thought that considerable benefit could be derived from the practice, others considered it inhuman. A vote was taken on the question, which resulted in a majority of six to two in favour of dehorning calves, and five to four in favour of dehorning grown cattle.

Whyte-Yarcowie, August 15.

PRESENT—Messrs. Pearce (chair), Hunt, G. R. and G. D. Mudge, Baynes, Jenkins, Ward, Pascoe, and Lock (Hon. Sec.) and one visitor

MOTOR-TRACTION ON THE FARM.—The Chairman read a few extracts dealing with this subject. In the discussion which followed members agreed that while the cost of installing and the up-keep of motors on the farm would be considerable, at the present prices of horses and feed it should pay well. They considered, however, that the motor had not yet been sufficiently tested for reliability and durability on the farm for its general adoption. Interest was evinced in the motor now installed at the Roseworthy Agricultural College.

STRANGLES IN HORSES.—The Chairman reported having horses affected with this disease, and said he had treated them by giving them stockholm tar and eucalyptus to inhale by means of a nosebag. This had afforded them relief.

Wilmington, August 1.

PRESENT—Messrs. Broadbent (chair), Stephens, Noll, Payne, Farrell, H., W., G., and J. Schuppan, S. and D. George, Slee, Zimmermann, Hoskins, Robertson, McGhee and Jericho (Hon. Sec.) and two visitors.

MACHINERY ON FARMS.—Mr. J. Schuppan read a paper on the "Care of Machinery on Farms" to the following effect:—"It is practising economy to take proper care of implements and machinery, and the careful farmer need not be reminded of this fact; but there are many who pay a high price for their implements, grumble at the cost, and yet take little or no care of them. 'A stitch in time saves nine' applies particularly to harvesting-machinery. Often after harvesting-operations are completed valuable implements are allowed to remain in the open exposed to all weathers, until required for the next season's work. Such carelessness is naturally ruinous to the machine and a loss to the farmer. The woodwork swells during the wet weather, and nuts are drawn into the timber, only to become loose when the warm weather sets in. Men who allow their machinery to remain unprotected in this way seldom overhaul it before use, and consequently the defects are not noticed until a breakdown occurs in the field, resulting in a delay for repairs and the loss of much valuable time. At the close of each harvest the machinery should be overhauled, repaired where necessary, and placed under cover. Many farmers are afraid of the work and expense incurred in the erection of a proper shed for implements, but this a 'penny-wise and pound-foolish' policy. Farmers whose homesteads appear clean, up to date, and with a large number of sheds and outhouses, are judged to be wealthy, but very often the carefulness of a farmer is mistaken for wealth. The careless farmer always has an excuse for not getting on. In his opinion bad luck is constantly following him, but, as likely as not, carelessness is at the bottom of it all. Fowls may be seen in the horse-stable scratching in the mangers and at night are allowed to roost on valuable machinery and vehicles. Farmers who allow such things on their farms certainly cannot be termed thrifty."

Woodside, August 8.

PRESENT — Dr. Verco (chair), Messrs. Fowler, W. and H. Rollbusch, Drummond, Keddie, Morcom, and Hughes (Hon. Sec.).

FLAX-GROWING.—Mr. W. Rollbusch read a paper dealing with this subject to the following effect:—"Flax-growing was a matter that had not received much attention in this State. That it is of importance is evidenced by the fact that the Federal Government is offering a bonus of 10 per cent. to growers in order to encourage the industry. The value of flax and hemp imported into Australia in 1906 was £167,281; linseed- and oil-cake, £1,388; and linseed oil, £105,309. Great Britain imports flax to the value of over £3,000,000 annually, and linseed to the value of £3,274,000. There would, therefore, be every prospect of a good market, for when the local demand was exceeded, the surplus could be exported to the Old Country. Germany was also a large buyer. Messrs. Wolff Bros., of Victoria, had received an

offer from there to buy 2,000 tons annually at a good figure. That flax can be grown successfully, in some parts of the State at least, has been proved. In the Onkaparinga district years ago many of the farmers used to grow small plots of flax, the seed of which was used principally for the purpose of feeding calves. Some of the growers put in as much as fifteen acres, and it grew to a height varying from 2 ft. 6 in. to 4 ft. in height. All land is, of course, not suitable for flax-growing; but land that will grow potatoes or oats will also grow flax, and it can even be grown on more inferior soil with a dressing of 2 cwt. of superphosphate. There should, however, be a rainfall of about 30 in. per annum. [Flax can be grown successfully on a much smaller rainfall than 30 in.—ED.] It is grown very successfully in some parts of Victoria; Messrs. Wolff Bros. had 420 acres under crop in 1903, and their gross returns amounted to £16 16s. per acre, which, after deducting working-expenses, left a net profit of £8 per acre. In addition to this the 10 per cent. bonus now offered would have to be taken into consideration. Messrs. Wolff Bros. have their own mills, and are going in for the industry very extensively. They purchase flax from the farmers at the rate of £3 per ton on trucks, provided the seed is not damaged and is from 2 ft. 6 in. to 3 ft. high. The yield averages from 2½ to 3 tons per acre. The seed sells readily at £14 per ton, which works out at about 7s. 6d. per bushel. It was once thought that good fibre and seed could not be obtained at the same time; if fibre was wanted, the crop would have to be cut before the seed was ripe; and if seed was wanted, the plant was allowed to mature and the fibre considered of little use. This theory has since proved erroneous. It was also contended that it had to be hand-gathered, but it is now cut with the binder at the rate of from ten to twelve acres a day; the knives, of course, had to be kept very sharp. In preparing the land for flax it is necessary to plough deeply and work down to a fine tilth. The seed should be broadcasted, then lightly harrowed in and rolled. May is the best time for sowing. There are many parts where flax-growing could be successfully carried on in this State and at a greater profit than hay, as the price for flax is not so subject to fluctuations as hay and chaff. The best plan would be for farmers in suitable localities to co-operate amongst themselves and either erect or rent a building suitable for a mill, and purchase the necessary machinery for the manufacture of the fibre, for the returns per acre are much greater when this is done than if the flax is merely grown and sold as cut. An acre of flax will produce about 5½ cwt. of fibre, which sells at from £40 to £45 per ton. It has been proved that the old system of pit-retting was not necessary, the more simple process of spreading the flax out on the grass in the autumn and allowing the dew and rain to do the work being now adopted. He thought that if the Government was approached in the matter it would do all in its power to assist the producer in giving this industry a fair trial.

Yallunda, August 8.

PRESENT—Messrs. Provis (chair), Olston, Liddy, Fairbrother, Elliott, Walter, Farnham, and Wilson (Hon. Sec.).

FOALS AND THEIR TREATMENT.—Mr. P. Liddy read a short paper on this subject. He stated that in the case of a farmer who breeds only one or two foals a year the foal should be taken in hand immediately after weaning. When the foal is taken from its mother he thought it a better plan to close it up in a pen, rather than turn it into a distant paddock, where there is more chance of injury to itself. The foal should be led to water, but in doing this the bit should not be used. Either a halter or else an ordinary rope tied around the neck with a half hitch around the nose will do duty for this. It should be tied up occasionally when someone is near to see that no harm occurs. The most important point in the rearing of a foal is that it should be well fed. When the mare is away, the foals might be allowed out for exercise, but locked in again before the mother returns. He thought it would take about five weeks to wean a foal, and allow the mare to run dry. It was a mistake to make a pet of the foal; this should be avoided. Some discussion followed the reading of the paper.

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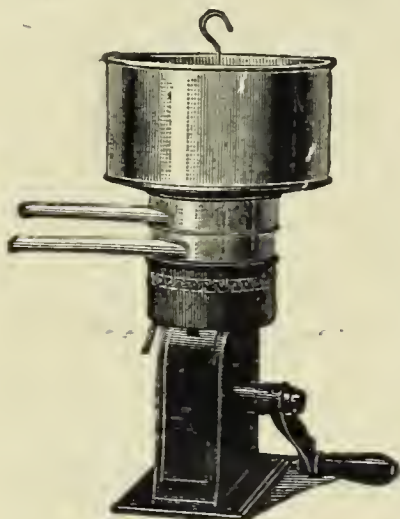
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O. CRONK, Moorlands, Gladstone.

The “Domo” Hand Separator—			9 galls capacity			Net Cash.			Extended Terms.		
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No.	0	16	„	4	15	0	5	15	0	} Deposit £1, and 10s. Monthly Instalments.	
	1	20	„	5	15	0	6	17	6		
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A. W. DOBBIE & CO.,

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 Gawler Place, ADELAIDE.

MAKERS OF SPRAY AND OTHER PUMPS.



A Broken Drum
 Cannot be Beaten ! !

NEITHER CAN

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Plough and Scarifier

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BUILDERS' AND WHEELWRIGHTS' REQUISITES A SPECIALTY.
GALVANIZED IRON—PLAIN AND CORRUGATED, CURVED
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(W. C. R. WARD, for the last 17 years with Messrs. W. R. Cave and Co., Elder, Smith, & Co., Ltd., and Dalgety & Co., Ltd. W. E. ACRAMAN, late of Acraman Bros., North Coolgardie Goldfields, Western Australia, and for the last three years representing Messrs. B. Seppelt & Sons, Ltd., as their Western Australian travelling representative).

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As used by the Department
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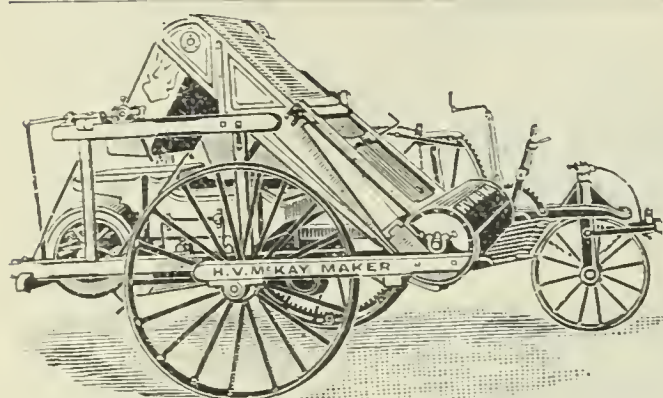
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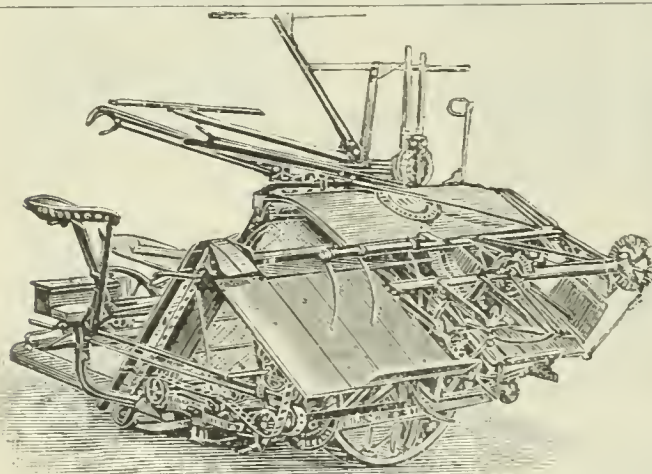
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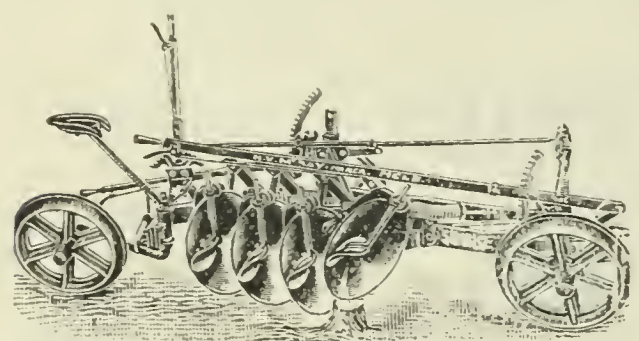
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The "Sun" Grain and Fertilizer Drill.

All sizes, with Hoes or Discs. Solid
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Positive and Uniform in Sowing.
The Most Durable Drill in the Market.



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Made in 2, 3, 4, 5, and 6-furrow.
Adjustable for wide and narrow furrows.
Easy Lift, Perfect Steering, Spring-
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Ask for Catalogue L7. Posted Gratis to any address, describing the above: also Stump-jump Mouldboard Ploughs, Disc Cultivators, Horseworks, Chaffcutters, Gates, Trucks, Bag Loaders, Machinery Oils, and other Farm Requirements.

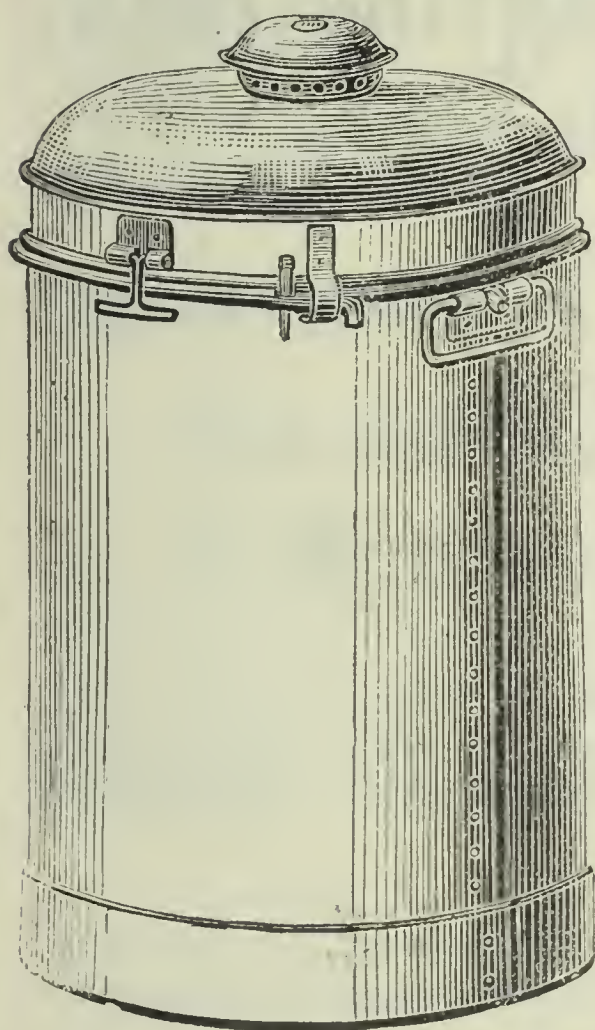
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AGENCIES IN ALL AGRICULTURAL CENTRES.

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Cream Transport Cans.



3 Gallons, 14/6 ; 5 Gallons, 17/6 ;
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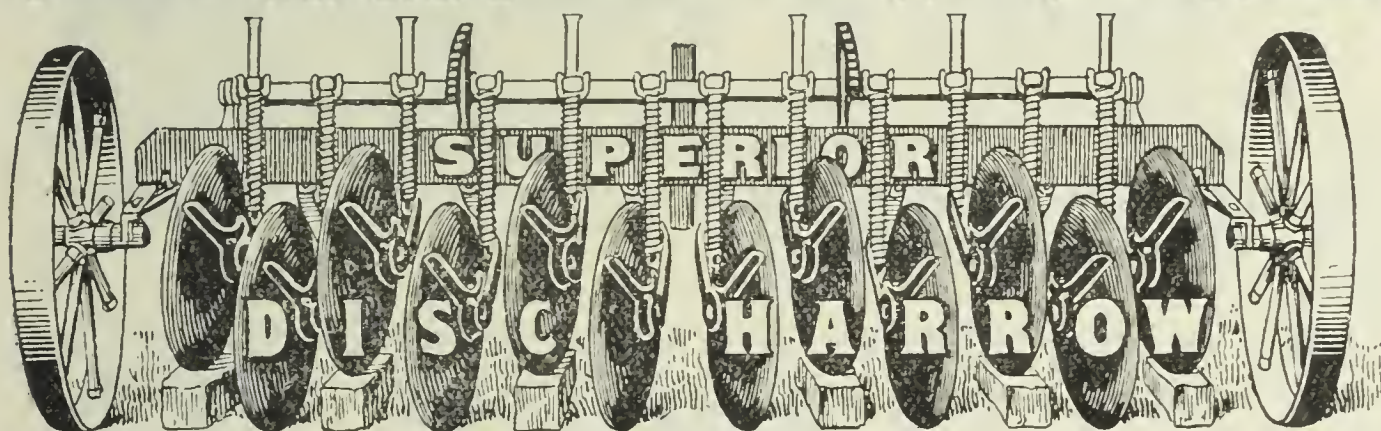
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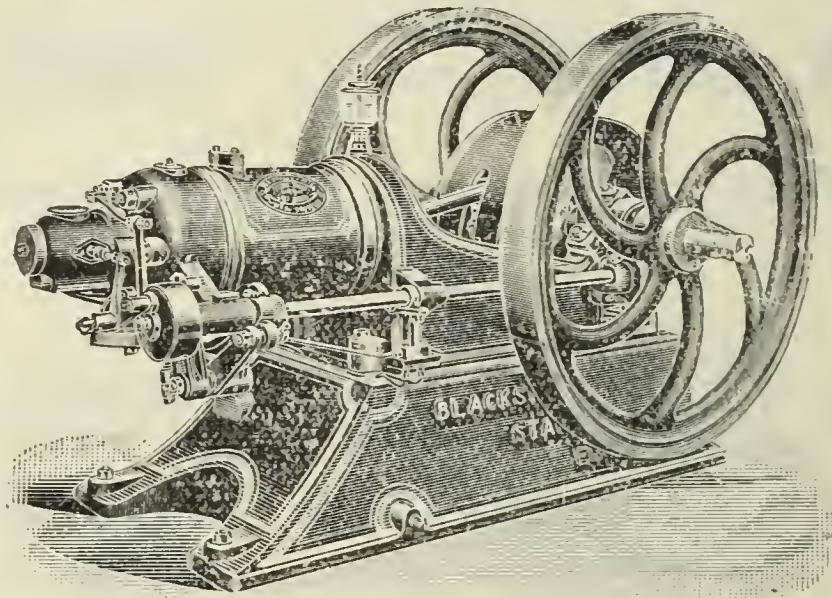
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The BLACKSTONE Oil-engine

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Sizes from 25 to 12,000 b.h.p.

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the Pioneer of sheep-shearing by machinery, still leads.

Has beaten all others in open competition. The number sold largely exceeds all other makes combined. Contracts undertaken to supply complete Shearing plants.

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We offer a CHALLENGE to ALL CREAM SEPARATORS in South Australia for CLEAN SKIMMING, EASY RUNNING, and DURABILITY.

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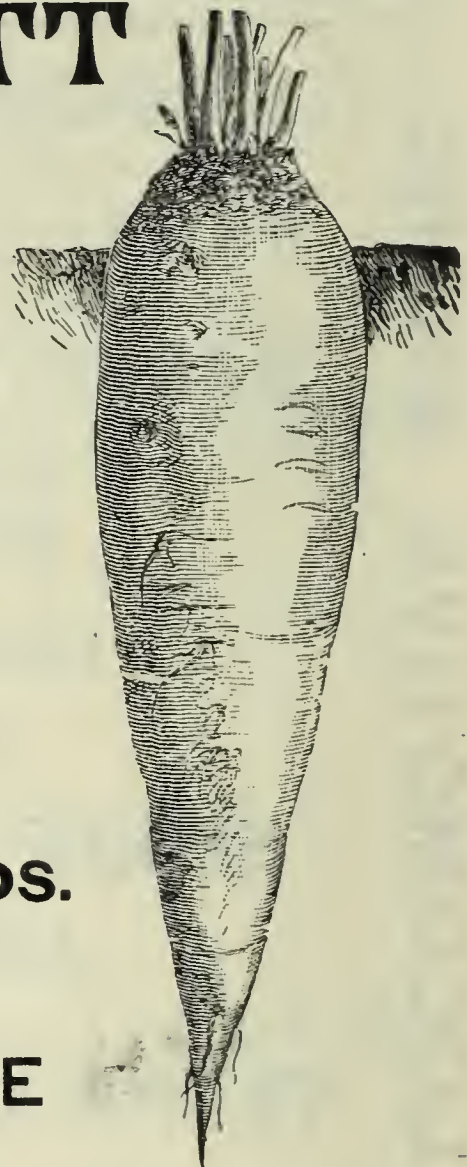
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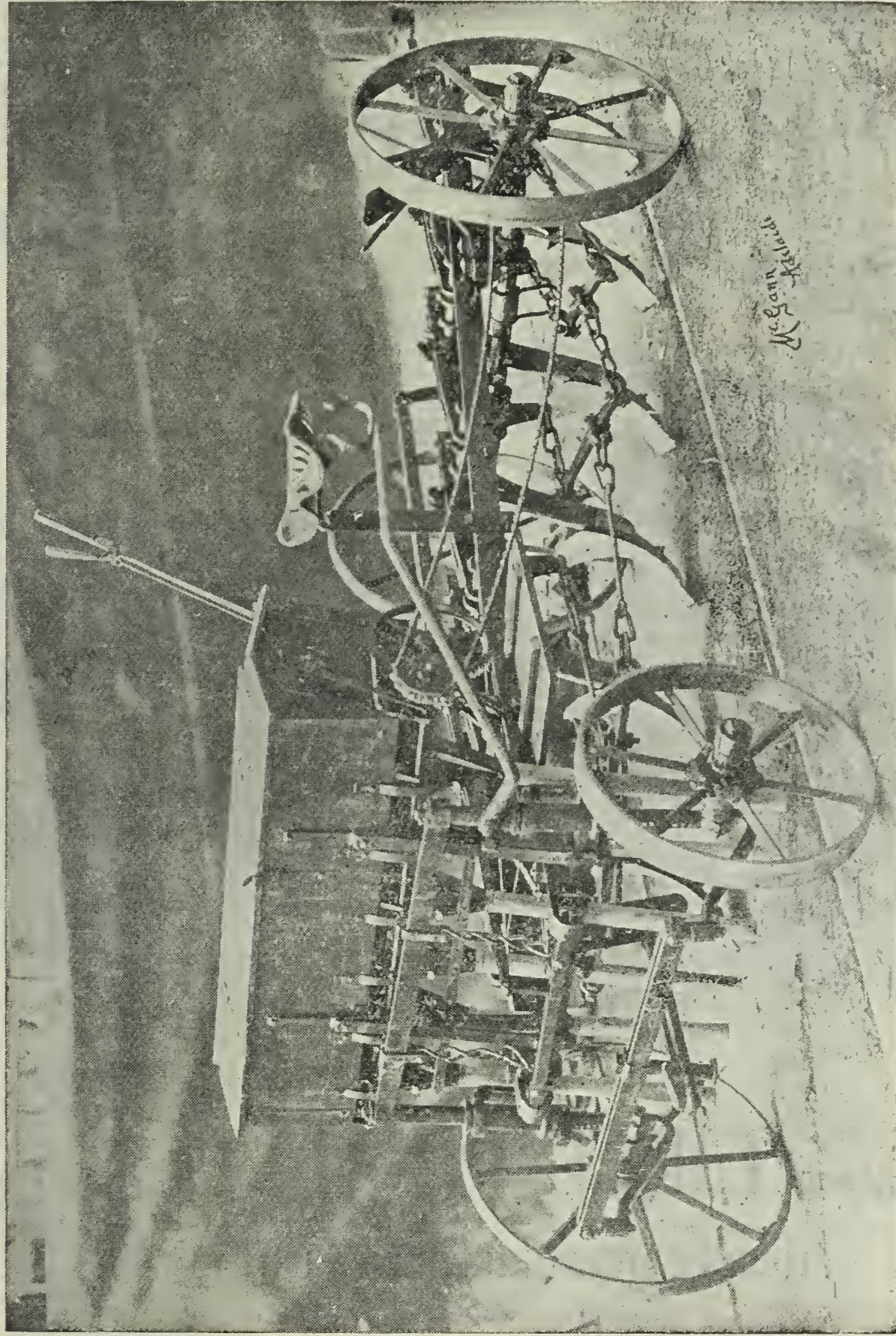
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Clarence H. Smith's Celebrated Patent Seed and Fertilizer Plough Combination.

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HUNDREDS NOW IN USE IN ALL THE STATES.



FIRST AWARDS AT ALL SHOW SOCIETIES.

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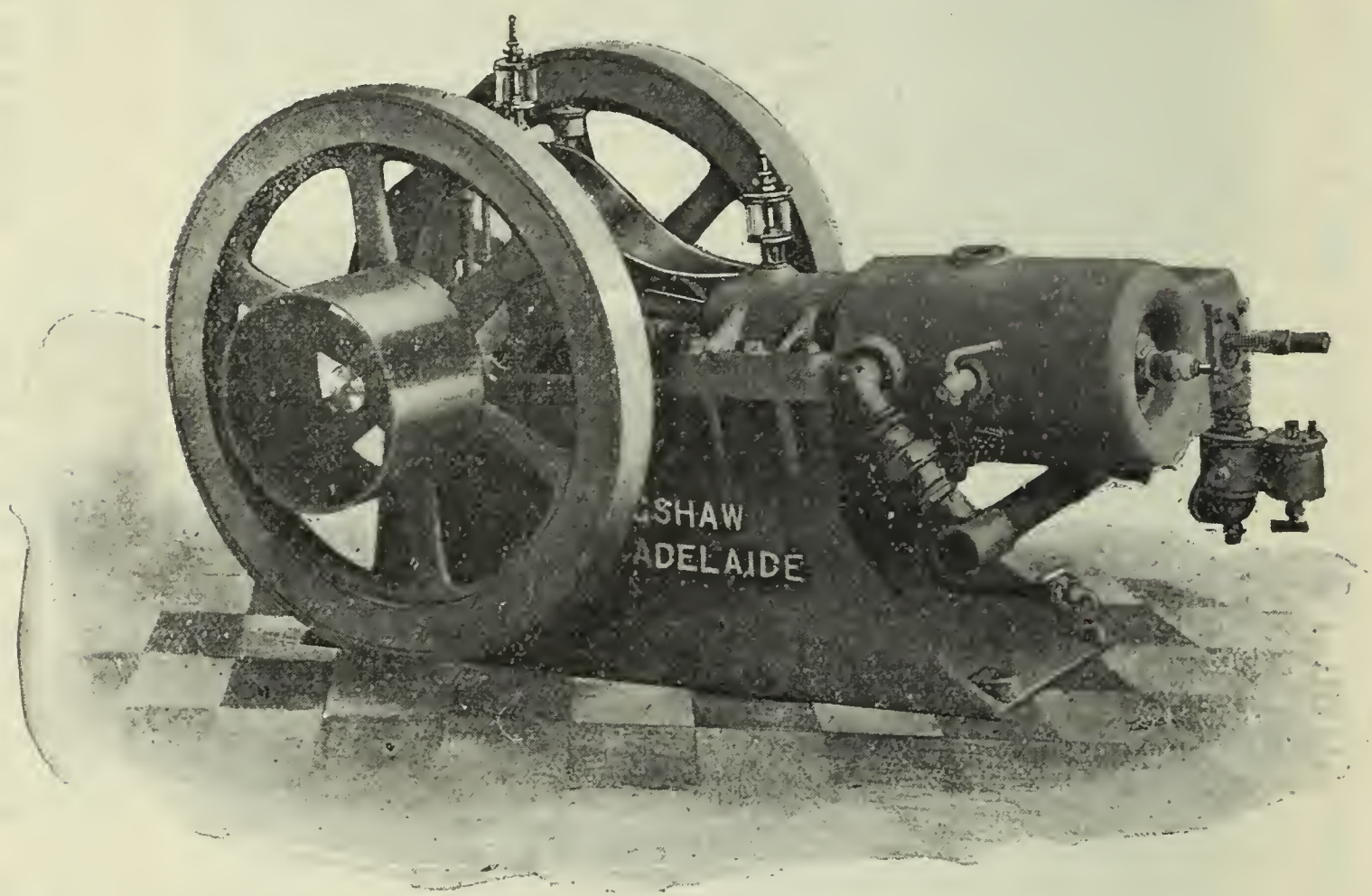
Combination and Method of Attachment PATENTED.

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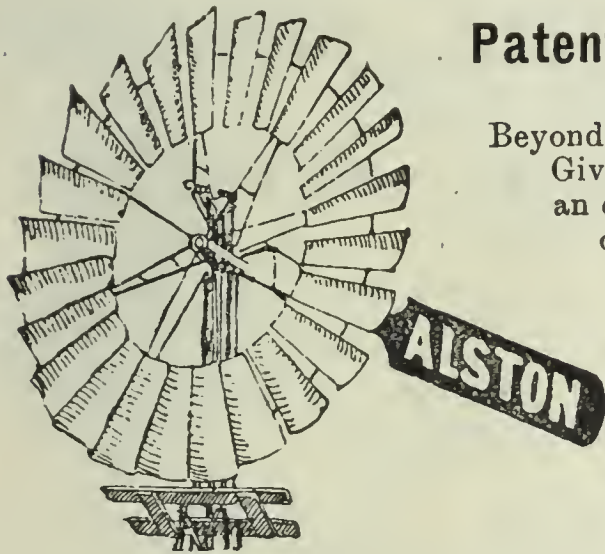


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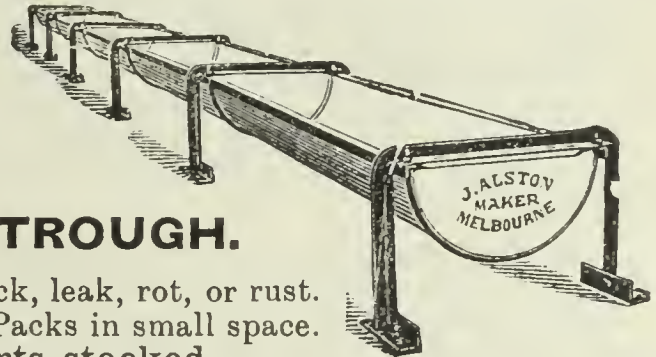
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Beyond dispute the most perfect wind-motion in existence.
Gives a direct and centre lift of the pump-rod, and
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Fitted with steel roller and ball bearings. Do
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All lengths. Write me your requirements. Packs in small space.
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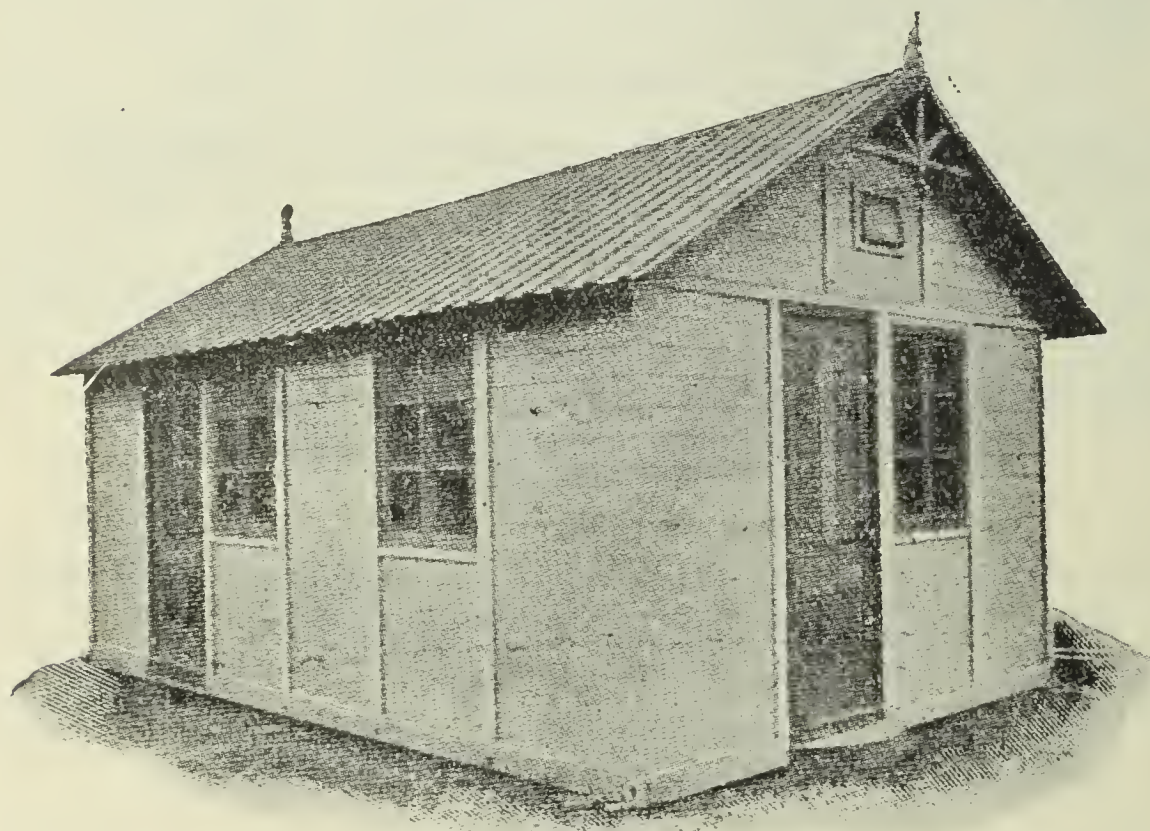
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against mortality arising from NATURAL CAUSES AND ACCIDENTS, as well as
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Metters' All-steel Wind Motors.

Have proved
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LAWES' SUPERPHOSPHATE.

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CUT CLEAN AND LOW

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Wide Open-End Elevators,

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SPECIAL ECCENTRIC WHEEL.



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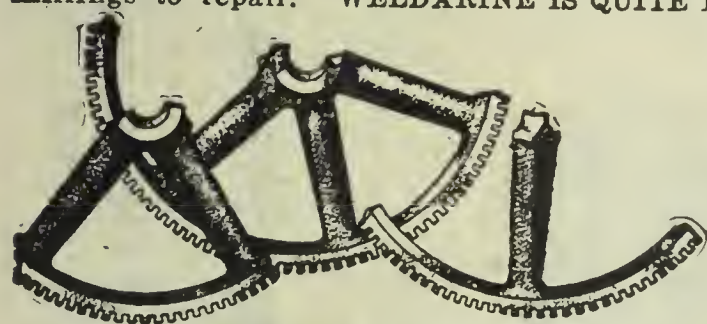
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WELDARINE
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for Seed-Drills and Cultivators. No harrowing required after Cultivator or Drill, thus saving a great amount of time. A great invention and a great success. Simplicity itself. Anyone can fix them. They only weigh a few pounds; are right out of the way; perfect jumpers; level the land; and cover the seed beautifully. Only one required on every other hoe. No extra draught. In damp or wet weather draught considerably lighter, as hoes can be worked same depth as in fine weather. Price, set of 7 for 13-hoe, 37s. 6d.; or 5s. 4d. each. Testimonials. Write to

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SHEARER'S Patent Stump-Jump **PLOUGHS**

Made in Three Weights
Standard, Light, or
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Two to Six Furrows.:

Also,
CULTIVATOR PLOUGHS
Eight to Twelve
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Fitted with New Patent
Foot and Share and "Patent
Lifting Device" and Con-
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the greatest satisfaction.



EXTRA STRONG PLOUGH.

Farmers who handle them say that they are a pleasure to plough with on account of the ease with which they are adjusted either walking or riding, the good work they do, and the lightness of their draught.
EVERY PART of our ploughs is INTERCHANGEABLE, each being made to template. All the working parts are accurately turned and fitted by skilled artisans, consequently there is nothing sloppy about these ploughs, and the best spring steel is used in building them.

We are Makers of the **Patent Wrought Steel Plough and Cultivator Shares.** Stocked by all
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BEST QUALITY, DRY AND FREE-RUNNING SUPER-PHOSPHATE TO GO THROUGH DRILLS.

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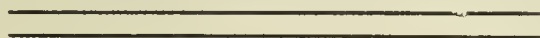
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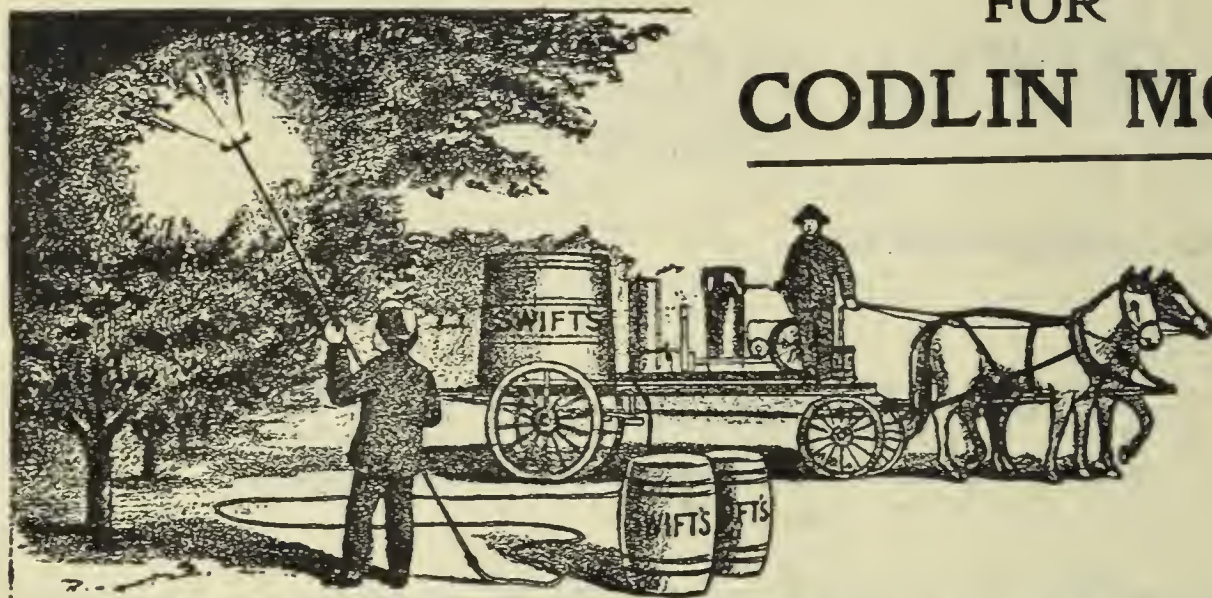
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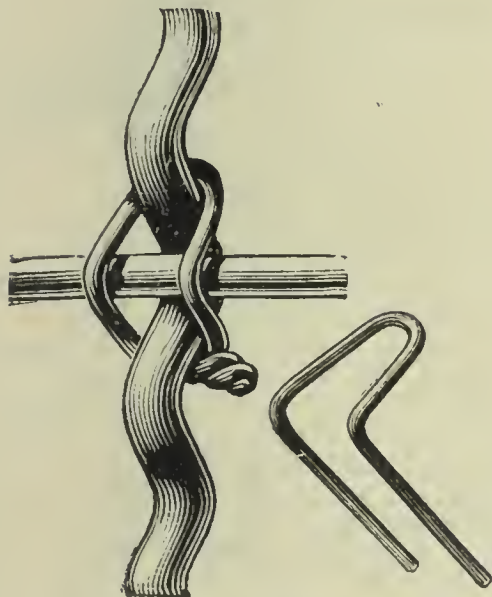
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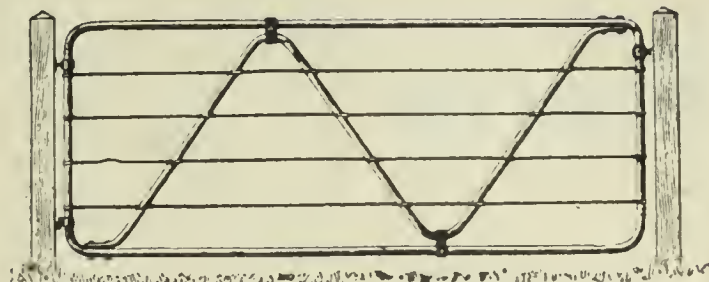
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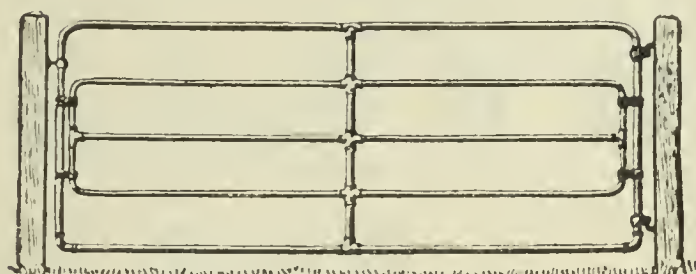
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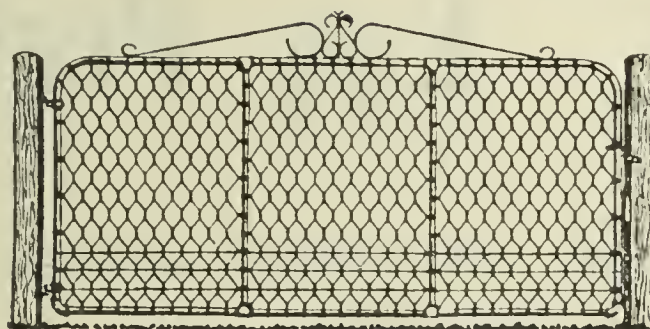
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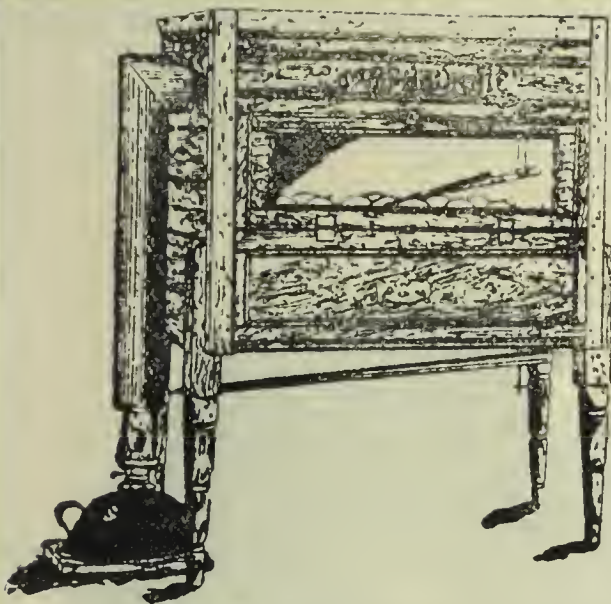
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Full particulars in *Government Gazette*, or obtainable, with plans, from the Surveyor-General.

Lands that will be Open to Application Shortly.

Lands in the following HUNDREDS will probably be gazetted open to application during the months stated:—

PFLAUM, at Bangham (between the Hundreds of Tatiara and Binnum), in the South-East, and VERRAN, west of Arno Bay (west of the Hundred of Roberts), in the Franklin Harbour District, about SEPTEMBER, 1908; ETTRICK, east of the Hundred of Burdett (east of Murray Bridge), and SEDDON (south part), west of the Hundred of MacGillivray, on Kangaroo Island, about OCTOBER, 1908; BAKARA, HOLDER, MANTUNG, MOOROOK, and WAIKERIE, in County Albert, east and south of the River Murray, also HYNAM ESTATE, in the South-East, about NOVEMBER, 1908.

Full particulars will be published in the *Government Gazette*, and will also be obtainable, with plans, from the Surveyor-General.

The attention of intending applicants for land is also directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Surveyor-General's Office. The list shows the areas, localities, prices, etc., of the sections available, and the conditions under which they may be applied for.

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Commissioner of Crown Lands.

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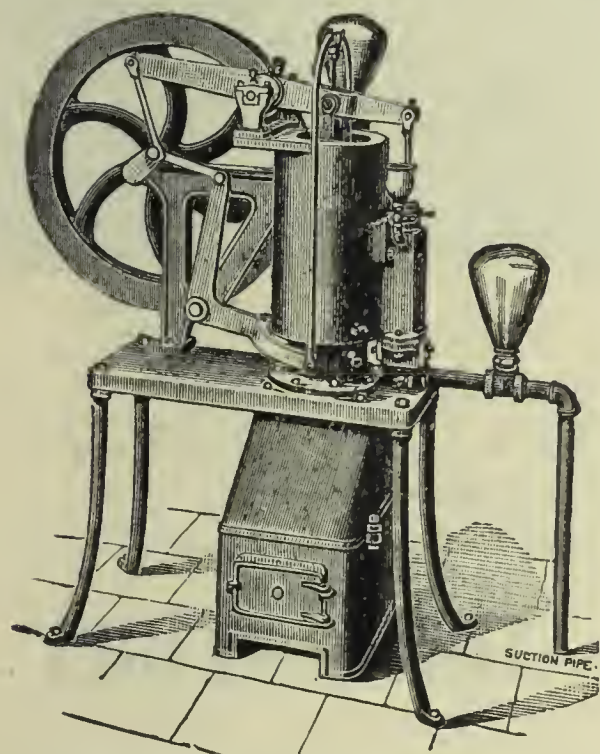
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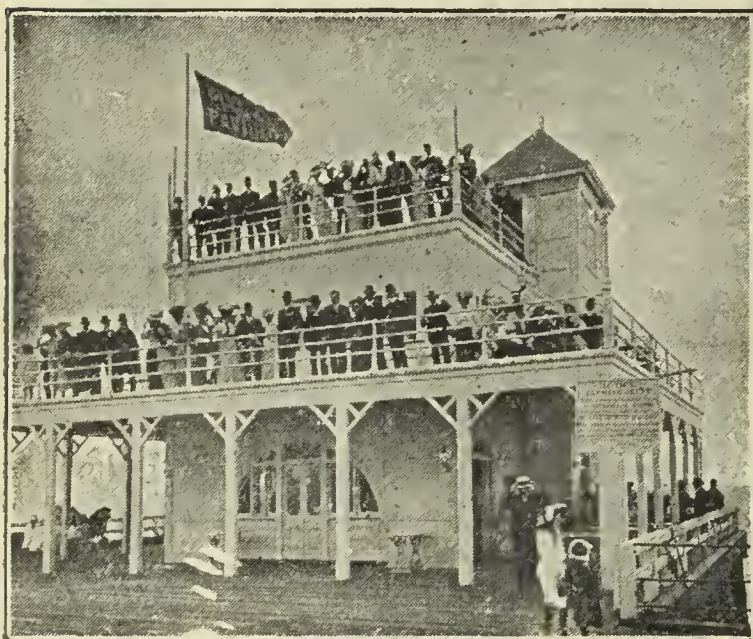
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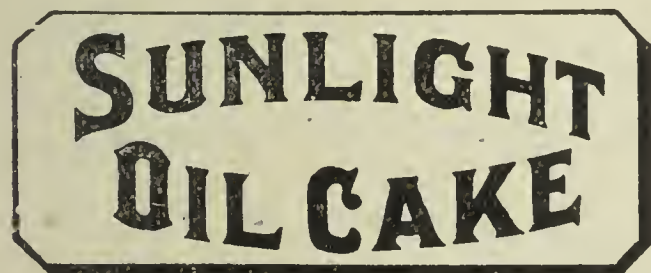
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SEPTEMBER, 1908.

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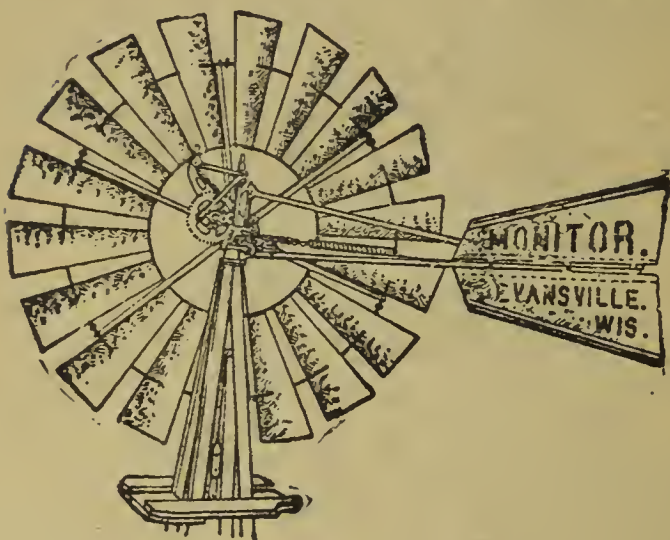
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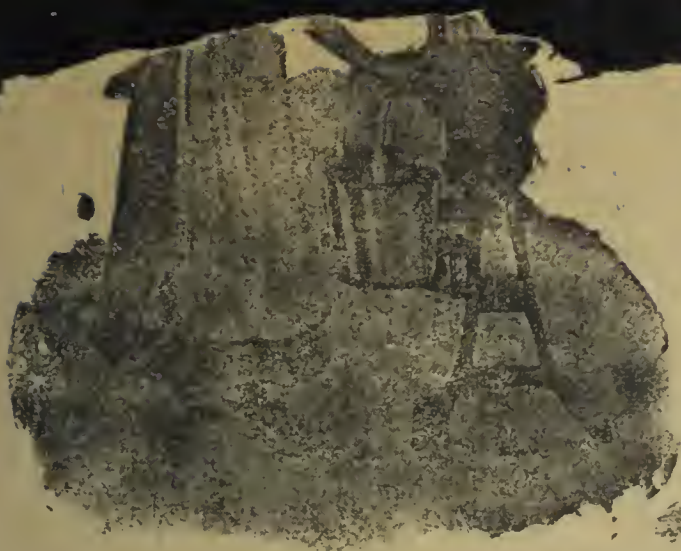
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